User's manual

TransForm A

Workstation for Windows®

DOC-3266-2, Current Version

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	Main issue	update
chapter 1		
chapter 2	add.	
chapter 3	add.	
chapter 4	add.	
chapter 5		
chapter 6	add.	
chapter 7		
chapter 8		
chapter 9		

new: The corresponding chapters are new or completely revised.
corr.: Passages of the corresponding chapter were corrected; see modification bars.
add.: Passages of the corresponding chapter were added; see modification bars.

This manual refers to following hardware and software configurations of TRANSFORM A – Workstation for Windows:

Display Driver	R4.4

Document History

Modifications which result in a new version are indicated by a vertical bar.

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The environmental conditions as well as the servicing and maintenance regulations specified in this manual must be complied with by the customer.

Revision sheet

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Please correct the following points in this documentation (**DOC-3266-2**):

page	wrong	correct

Contents

1 Introduction

This chapter explains the structure of the manual itself and the used typographic styles and symbols. Safety information is provided concerning the operation of computer systems from Barco.

1.1 How this manual is organized

This manual describes design and startup of TRANSFORM A – Workstation for Windows from Barco. It is divided into nine chapters:

- **Introduction**
  explains the structure of the manual itself and the used typographic styles and symbols. Safety information is provided concerning the operation of computer systems from Barco.
- **Summary**
  gives an overview about the features of TRANSFORM A.
- **Getting Started**
  describes the setup of TRANSFORM A.
- **Operating**
  shows the capabilities which TRANSFORM A offers displaying graphics and video.
- **Maintenance**
  describes the maintenance of TRANSFORM A.
- **Advanced Configuration**
  may provide useful information for reconfiguring the software of your TRANSFORM A.
- **Technical Appendix**
  gives tabular overviews about the technical details of TRANSFORM A, its components and of their interfaces.
- **Troubleshooting**
  gives advice, if your TRANSFORM A does not operate properly.
- **Index**
  lists the keywords of the manual.

Chapters, pages, figures and tables are numbered separately. Chapters are indicated by a »point syntax«, e. g. **4.2.3**, pages by a »dash syntax«, e. g. **2-1**, as figures and tables are, e. g. **figure 5-4**.

1.2 Styles and symbols

The typographic styles and the symbols used in this document have the following meaning:

Bold	Labels, menus and buttons are printed in the **Bold** font.
Condensed	Links to both other chapters of this manual and to sites in the Internet are printed condensed. In the on-line version of this manual all hyperlinks appear teal.
`Courier`	Names of files and parts from programs are printed in the `Courier` font.
`Courier bold`	Inputs you are supposed to do from the keyboard are printed in **`Courier bold`** font.

↳	**Within a piece of programming code this arrow marks a line, that must be made up in two lines, though meant to be one line.**
	**If you do not heed instructions indicated by this symbol there is a risk of damage to the equipment!**
	**If you do not heed instructions indicated by this symbol there is a risk of electrical shock and danger to personal health!**
	**If you do not heed instructions indicated by this symbol there is a risk of damage to parts, which are sensitive towared electrostatic charge!**
	**If you do not heed instructions indicated by this symbol there is a risk to get harmed by sharp objects!**
	**If you do not heed instructions indicated by this symbol there is a risk that parts may explode!**
	**If you do not heed instructions indicated by this symbol there is a risk that hot parts impact persons or objects!**
	**The sheet icon indicates additional notes.**
	**Next to this icon you find further information.**
	**This icon marks tips.**
	**Next to this icon you find important notes.**

1.3 Safety instructions

This section describes safety precautions which must be observed when installing and operating a product from Barco.

1.3.1 Standards

Safety regulations

TRANSFORM A is built in accordance with the requirements of the international safety standard IEC-60950-1, UL 60950-1 and CSA C22.2 No. 60950-1-03, which are the safety standards of information technology equipment including electrical business equipment.

These safety standards impose important requirements on the use of safety critical components, materials and isolation, in order to protect the user or operator against the risk of electric shock and energy hazard, and having access to live parts.

Safety standards also impose requirements to the internal and external temperature variations, radiation levels, mechanical stability and strength, enclosure construction and protection against risk of fire.

Simulated single fault condition testing ensures the safety of the equipment to the user even when the equipment's normal operation fails.

Electromagnetic interference

Electromagnetic emission of TRANSFORM A complies with EN55022, EN61000-3-2, EN61000-3-3 and the limits for a class A digital device, pursuant to Part 15 of the FCC Rules.

Electromagnetic immunity of TRANSFORM A complies with EN55024.

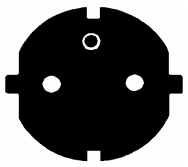
1.3.2 Precautions

For your own protection, observe the following safety precautions when installing, operating and servicing your device:

- Before operating the units please read this manual thoroughly and retain it for future reference!
- Observe all warnings and instructions printed on the devices!
- Servicing not explicitly mentioned in this manual should never be carried out by unauthorized personnel! Never open the case of the unit without first disconnecting the power supply cord!
- To prevent fire or electrical shock hazard, do not expose this unit to rain or moisture!
- This product should be operated from an AC power source!
- Check that the voltage and frequency of your power supply match those printed on the device label with the rated electrical values!
- If you are not sure of the type of AC power available, consult your dealer or local power company!
- This product is equipped with a 3-wire grounding plug, a plug having a third (grounding) pin. This plug will only fit into a grounding-type power outlet. This is a safety feature. If you are unable to insert the plug into the outlet, contact your electrician to replace your obsolete outlet. Do not defeat the purpose of the grounding-type plug!
- This equipment must be grounded (earthed) via the supplied 3 conductor AC power cable. (If the supplied power cable is not the correct one, consult your dealer.)

Mains lead (AC power cord) with CEE 7 plug:

The wires of the mains lead are colored in accordance with the following code:



yellow + green	Earth (Ground)
blue	Neutral
brown	Line (Live)

Figure 1-1
CEE 7 plug

Power cord with NEMA 5-15 plug:

- The cord set must be UL-approved and CSA-certified.
- The minimum specification for the flexible cord is No. 18 AWG, Type SVT or SJT, 3-conductor.
- The cord set must have a rated current capacity of at least 10 A.
- The attachment plug must be an Earth-grounding type with a NEMA 5-15P (10 A, 125 V) configuration.

The wires of the power cord are colored in accordance with the following code.

green or yellow + green	Earth (Ground)
blue or white	Neutral
brown or black	Line (Live)

Figure 1-2
NEMA 5-15 plug

Power cord with GB 2099 plug:

The wires of the power cord are colored in accordance with the following code.

yellow + green	Earth (Ground)
blue	Neutral
brown	Line (Live)

Figure 1-3
GB 2099 plug

- Do not allow anything to rest on the power cord. Do not locate this product where people will walk on the cord. To disconnect the cord, pull it out by the plug. Never pull the cord itself.
- If an extension cord is used with this product, make sure that the total of the ampere ratings on the products plugged into the extension cord does not exceed the extension cord ampere rating.
- Never push objects of any kind into this product through cabinet slots as they may touch dangerous voltage points or short out parts that could result in a risk of fire or electrical shock.
- Never spill liquid of any kind on the product. Should any liquid or solid object fall into the cabinet, unplug the set and have it checked by qualified service personnel before resuming operations.
- Lightning - For extra protection for this video product during a lightning storm or when it is lift unattended and unused for a long period of time, unplug it from the wall outlet. This will prevent damage to the unit due to lightning and AC power-line surges.

Due to high touch current, the OmniBus A12 and the OmniBus A18 is intended to be used in a location having equipotential bonding:

- The building installation shall provide a means for connection to protective earth.
- The equipment is to be connected to that means.
- A service person shall check whether or not the socket outlet from which the equipment is to be powered provides a connection to the building protective earth. If not, the service person shall arrange for the installation of a protective earthing conductor from the separate protective earthing terminal to the protective earth wire in the building.

1.3.3 Unpacking of devices

Note advises on the packaging for unpacking!

1.3.4 Installation

- Do not place this unit on an unstable cart, stand, or table. The unit may fall, causing serious damage to it.
- Do not use this unit near water.
- Use only the power cord supplied with your unit. While appearing to be similar, other power cords have not been safety tested at the factory and may not be used to power the unit. For a replacement power cord, contact your dealer.
- Slots and openings in the cabinet and the sides are provided for ventilation; to ensure reliable operation of the unit and to protect it from overheating, these openings must not be blocked or covered. The openings should never be blocked by placing the product on a bed, sofa, rug, or other similar surface. This product should never be placed near or over a radiator or heat register. This unit should not be placed in a built-in installation or enclosure unless proper ventilation is provided.
- The maximum recommended ambient temperature for this equipment is 40° C.
- When using the unit in a multi-unit rack assembly or closed assembly the ambient temperature inside the assembly may not succeed the maximum rated ambient temperature.
- When installed in a rack, the installation should be such that the amount of air flow required for safe operation of the equipment is not compromised. The mounting of the equipment should be such that no hazardous condition is achieved due to uneven mechanical loading.

1.3.5 Servicing

Mechanical or electrical modifications others than described in this manual must not be made to the devices. Barco is not liable for damages resulting from modified devices.

Only authorized personnel should carry out other maintenance work not explicitly mentioned in this installation manual!

Never open the case of TRANSFORM A without first disconnecting all power supply cords! Measurements and tests with the opened device may be carried out only in the factory or by specially trained personnel, due to the dangers of electrical shock.

1.3.6 Cleaning

Unplug this product from the wall outlet before cleaning. Do not use liquid cleaners or aerosol cleaners. See section 5.2 Cleaning for a cleaning instruction!

1.3.7 Re-packing

Keep the original shipping carton and packing material; they will come in handy if you ever have to ship your unit. For maximum protection, repack your set as it was originally packed at the factory.

1.4 Online manual

On the TRANSFORM A Suite CD **CRS-3045-C** this manual **DOC-3266-2** can also be found in electronic form. Insert the CD TRANSFORM A Suite **CRS-3045-C** in the CD ROM drive. If autorun is enabled on TRANSFORM A the start page of the CD comes up. If the CD does not start automatically, open the file **index.htm** from the CD by means of the Explorer. Follow the links named **Product software -> Windows driver suite** for the release of the graphic driver that is installed on TRANSFORM A and chose the related documentation**.**

Acrobat Reader can be used to view **doc-3266_XX_owners.pdf**. Adobe® Acrobat® Reader is free and freely distributable software that lets you view and print Adobe Portable Document Format (PDF) files.

If Acrobat Reader is already installed, the manual can be viewed just by a click on the link. Else the Acrobat Reader must be installed first. Its setup program can be found on the CD in section **Product software -> 3rd party tools**.

2 Summary

This chapter gives an overview about the features of TRANSFORM A.

2.1 Properties

TRANSFORM A was designed to control large, modular OVERVIEW display walls. Its multi-screen capability allows you to control displays of up to 80 and more projection modules. The display area is one logically connected display (a large Windows 2000 or Windows XP desktop). Digital imaging devices based on modern technologies such as DLP™ and Poly-Silicon LCD with the highest display quality are controlled digitally. Digital data transfer is immune to electromagnetic interference and therefore ensures the display wall picture to be displayed in absolutely distortion free image quality. Analog monitors and projectors can also be controlled by TRANSFORM A using the optional analog output. Thus, multi-monitor operator stations can be ergonomically designed and easily implemented.

(DLP is a trademark of Texas Instruments Incorporated)

The hardware and software of TRANSFORM A is based on world-wide accepted standards. TRANSFORM A offers the following exceptional capabilities:

- High performance graphics output using the most modern processor and chip technologies
- TRANSFORM A OMNIBUS devices with dedicated Switch Fabric and intelligent high-bandwidth backplane provides the optimized resources needed for graphic and video data integration
- Supports current LAN and WAN interfaces
- Graphic and video outputs in high color quality
- Video in a window, up and down scaleable up to full-screen
- Unlimited, overlapping and freely moveable video and graphics windows
- Up to 68 videos per display channel
- Virtually unlimited number of projection modules in one wall
- Virtually unlimited number of video sources per system
- High reliability, redundancy on system level and for critical components
- Dual processor as an option

The TRANSFORM A system provides a flexible and scalable architecture, which is suitable to support all sizes of display walls as well as requirements in RGB and video displaying capabilities. There are two principal ways to setup a system: For large display walls or high amounts of inserted sources one TRANSFORM A PROCESSOR is used that connects to up to five TRANSFORM A OMNIBUS devices; this is called OmniBus configuration. Smaller systems with up to 24 projection cubes can be set up with a TRANSFORM A PROCESSOR that might use an additional TRANSFORM A EXTENDER depending on the amount of video and RGB sources; this is called Processor configuration.

Independent in which configuration TRANSFORM A is setup, both the user and the application software »see« one single display. Installation, operation and service do not differ from that of a standard Windows 2000 workstation or a Windows XP workstation respectively.

OmniBus configuration

A TransForm A configuration that uses OmniBus devices is referred to as "OmniBus configuration". It combines one Processor with up to four or five OmniBus A12 or OmniBus A18 devices. The Processor is running the operating system and applications and controls the OmniBus devices where the graphical desktop is generated and integrated with the video and RGB insertion data. The Processor is equipped with link interface cards and optionally with network cards. The OmniBus devices host Barcos graphics cards as well as video and RGB input cards.

Medium sized systems can be set up with a Processor and one single OmniBus. For larger display walls with multiple video or RGB sources the system can easily be expanded with up to five OmniBus devices.

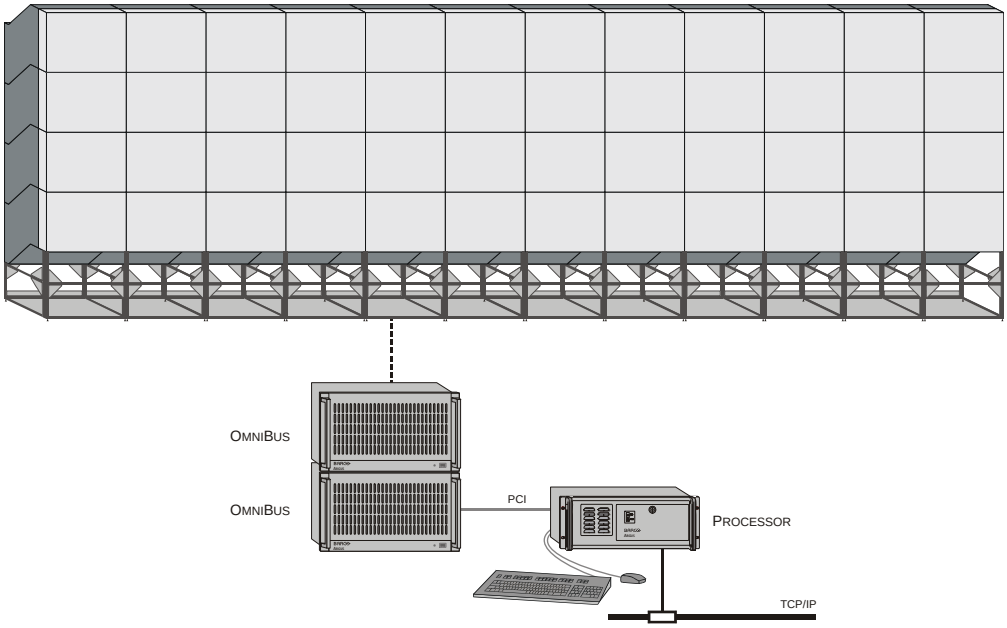


Figure 2-1
48 channel TransForm A in OmniBus configuration

Processor configuration

Small systems with one up to 24 projection cubes can be set up with a single Processor. Depending on the amount of video and RGB sources an additional Extender might be used; this setup is called "Processor configuration". All expansion cards are used in the Processor or as well in the Extender.

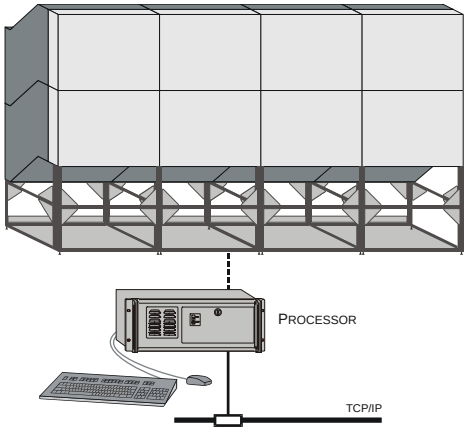


Figure 2-2
8 channel Processor in Processor configuration

3 Getting started

This chapter describes the setup of the TRANSFORM A – Workstation for Windows and provides you with a guide through the software configuration.

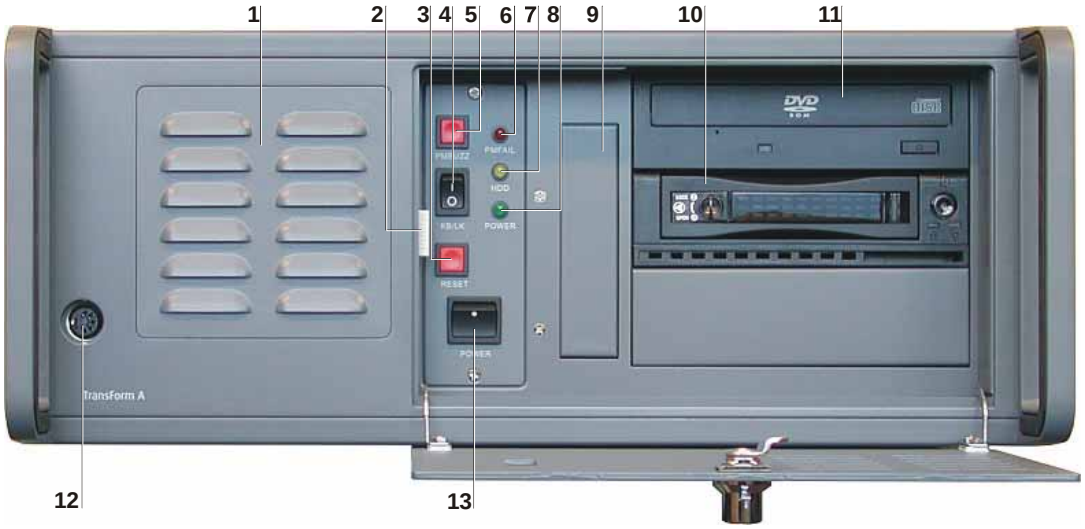
3.1 Examining

3.1.1 Processor

The PROCESSOR is available in several configurations differing in the type of the CPU, the power supply, and the system mainboard. The table below lists the possible configurations and related product codes which are used further on to indicate a particular device where applicable:

	standard power supply	redundant power supply 400 W	redundant power supply 650 W
Pentium® IV 3.4 GHz, 6 PCI slots	**AGS-3328-2**	**AGS-3328-3**	–
Core™ 2 Duo 2.13 GHz, 4 PCI slots, 3 PCIe slots	**AGS-3389-2**	**AGS-3389-3**	–
Dual Xeon® Dual-Core, 6 PCI slots	–	–	**AGS-3390-1**
Single Xeon® Dual-Core, 6 PCI slots	–	–	**AGS-3390-2**

The front



1	air supply		
2	handle of filter mounting		
3	restart button		
4	(*reserved*)		
5	buzzer reset button:	power module failed	(only applicable with redundant power supply)
6	red LED:	power module failed	(only applicable with redundant power supply)
7	yellow LED:	hard disk access	
8	green LED:	power on	
9	floppy disk drive *(optional)*		
10	hard disk drive / RAID 1 subsystem / RAID 5 subsystem		
11	DVD ROM drive		
12	(*optional, reserved*)		
13	power button		

Figure 3-1
front view of the PROCESSOR

Next to the air supply openings [1] there is the handle of the filter mounting [2]. In the center behind the front flap there are from top to bottom the **buzzer reset button** for power module failure [5], the **lock keyboard switch** [4] followed by the **restart** button [3] and finally the **power** button [13]. Next to these buttons to the right side there are three LED's. In the top position there is a red LED, indicating **power module failure** [6] of a redundant power module. The yellow LED indicates **hard disk access** [7] and the green LED indicates **power on**

[8]. On the right hand side there is optionally the floppy disk drive [9], followed by the DVD ROM drive [11] and below it the hard disk drive [10].

There are hard disks with parallel ATA (PATA) and serial ATA (SATA) available. They come as standard hard disks, RAID 1 hard disk system or RAID 5 hard disk system. PATA hard disks might be used in PROCESSOR models **AGS-3328**, **AGS-3389** or **AGS-3390**, SATA hard disks might only be used in PROCESSOR models **AGS-3389** and **AGS-3390**.

The figure above front view of the Processor includes the SATA standard hard disk drive.

The SATA hard disk for **AGS-3389** or **AGS-3390** has on its left side of the front a lock, which prevents from un-mounting the hard disk unintentionally.

While turning the lock it is easily possible to un-mount the hard disk. Therefore only turn the lock, if the PROCESSOR is switched off.

Figure 3-2
SATA hard disk

Each SATA RAID 5 hard disk provides three LED's at the front of the removable frame. If the red LED lightens permanently, this indicates that this particular hard disk has failed and should be replaced.

The extensive documentation of the LED codes can be found on the documentation CD of the RAID system.

Please note for the SATA RAID 5 systems:

A hard disk is already switched off by turning the frame lock key!

Never remove more than one hard disk while the system is running. Never remove any hard disks while the system is in rebuilt mode or switched off. Otherwise the system will crash and it cannot be restored!

Never change the sequential order of the hard disks. Otherwise the complete data on the drives will get corrupt and it cannot be restored!

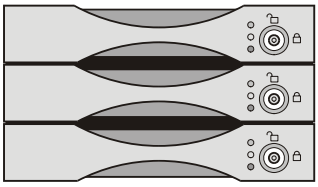


Figure 3-3
SATA RAID 5 hard disk drives

The SATA RAID 1 hard disk drive system looks similar, but has instead of the hard disk in the middle position a row of eight indicators, which display the different operating modes of the system.

The extensive documentation of the LED codes can be found on the documentation CD of the RAID system.

Please note for the SATA RAID 1 systems:

A hard disk is already switched off by turning the frame lock key!

A hard disk should not be replaced when the system is turned off. Doing so may lead to loss of data.

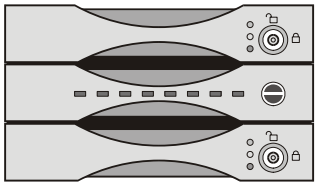
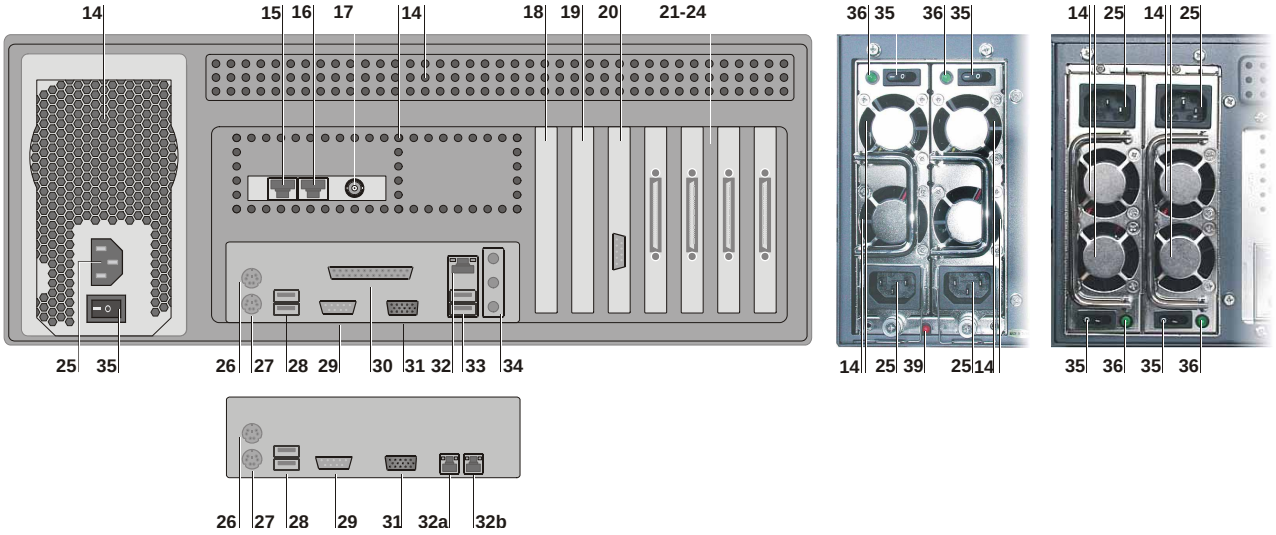


Figure 3-4
SATA RAID 1 hard disk drives

The back

PROCESSOR with standard power supply (left) and detail of a PROCESSOR with redundant power supply (right):



14	air supply		
15	genlock loop through in		
16	remote power on/off connector / genlock loop through out		
17	external genlock in		
	models AGS-3328-2/-3 and AGS-3390-1/-2	**models AGS-3389**	
18	COM2	PCIe ×16 extension cards	
19	PCI extension cards ...	PCIe ×1 extension cards	
20	PCI extension cards ...	COM2	
21-24	PCI extension cards like network cards, link interface cards, Barco's expansion cards etc. *(depending on configuration)*		
25	mains connection of power module		
26	PS/2 mouse *(green jack)*		
27	PS/2 keyboard *(purple jack)*		
28	2×USB		
29	COM1		
30	LPT1 *(not on AGS-3390-1/-2)*		
31	onboard VGA adapter		
32	onboard LAN adapter with the following LED signals:		
	left LED	lightens green	a connection exists
		blinking green	activity
	right LED	off	10 Mbps connection
		lightens green	100 Mbps connection
		lightens amber	1000 Mbps connection
33	2×USB *(not on AGS-3390-1/-2)*		
34	audio, micro *(not on AGS-3390-1/-2)*		
35	power switch of power module		
36	green LED: individual power module operating		
39	buzzer reset button: power module failed (only applicable with redundant power supply 650W)		

Figure 3-5
Rear view of the PROCESSOR with standard power supply (left), detail with redundant power supply 650W (middle), redundant power supply 400 W (right) and details of the rear connection plate of the PROCESSOR AGS-3390-1/-2 (bottom)

On the left hand side is the **mains connection** [25]. At the case of a PROCESSOR with redundant power supplies there is for both of the two power modules a **mains connection** [25] and additionally a **power switch** [35] and an **LED** [36] that indicates operation of the power module when lightened. In the middle of the power modules there is the air supply [14].

The **remote power on/off connector** [16] is for connection to OMNIBUS devices. With the optional connectors **external genlock in** [17] and **external genlock loop through in** [15] an external genlock signal can be connected to multiple PROCESSORS and OMNIBUS devices.

PS/2 mouse [26] is for plugging in a PS/2 mouse and **PS/2 keyboard** [27] is for plugging in a PS/2 keyboard. For USB mouse and USB keyboard the **USB jack** [28] can be used. With the **onboard LAN adapter** [32] the network connection can be established.

On the right hand side there are different PCI and PCI Express cards [18-24] inserted depending on the actual hardware configuration of the PROCESSOR.

To protect the PROCESSOR from overheating, the air supply openings in the case shall be kept free of obstructions!

To disconnect the PROCESSOR from the power supply all power cords have to be pulled of the mains connection [25]. Therefore the back panel has to be easily accessible!

The expansion slots

The PROCESSOR AGS-3328-2/-3 and AGS-3390-1/-2 provide each six PCI expansion slots for insertion of PCI expansion cards. Whereas the PROCESSOR AGS-3389 provide four PCI expansion slots for insertion of PCI expansion cards and three PCI Express expansion slots for insertion of 3rd party expansion cards. The slots are numbered in the following way, if looking from the back to the PROCESSOR: 2

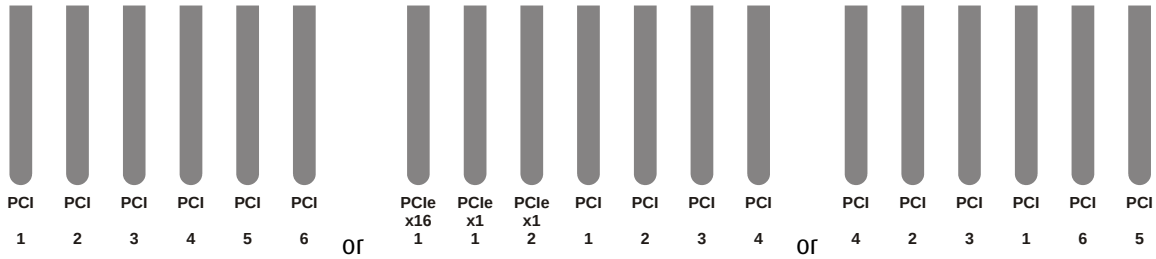


Figure 3-6
numbering of expansion slots on the back panel of the PROCESSOR:
AGS-3328-2/-3 (left) or AGS-3389 (middle) or AGS-3390-1/-2 (right)

With AGS-3390-1/-2 in Processor configuration the PCI slot no. 5 as numbered in the figure above may not be used for input cards due to mechanical requirements. In a configuration where all PCI slots are used the input card may be inserted into the PCI slot of an OmniScaler instead.

In the following sections reference is taken to the numbering of the slots.

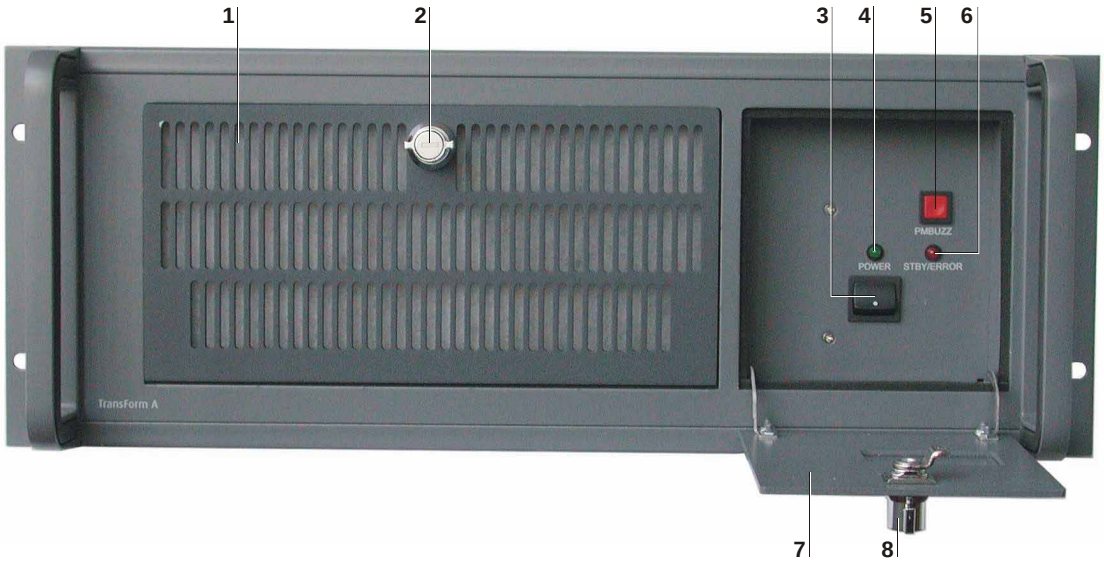
3.1.2 OmniBus A12

Each OMNIBUS A12 provides twelve PCI expansion slots. They can be used for Barco's UGX GRAPHIC CARDS, OMNISCALERS, QUAD ANALOG VIDEO CARDS, DUAL DVI INPUT CARDS, DUAL RGB INPUT CARDS, STREAMING VIDEO CARDS and QUAD SDI VIDEO CARDS.

Although the backplane of the OmniBus A12 is based on standard 64bit/66MHz PCI bus it is highly recommended to not insert other cards than those mentioned above.

Other cards will not work due to the missing driver support and there is also a risk to damage the OmniBus A12 or the inserted cards.

The front

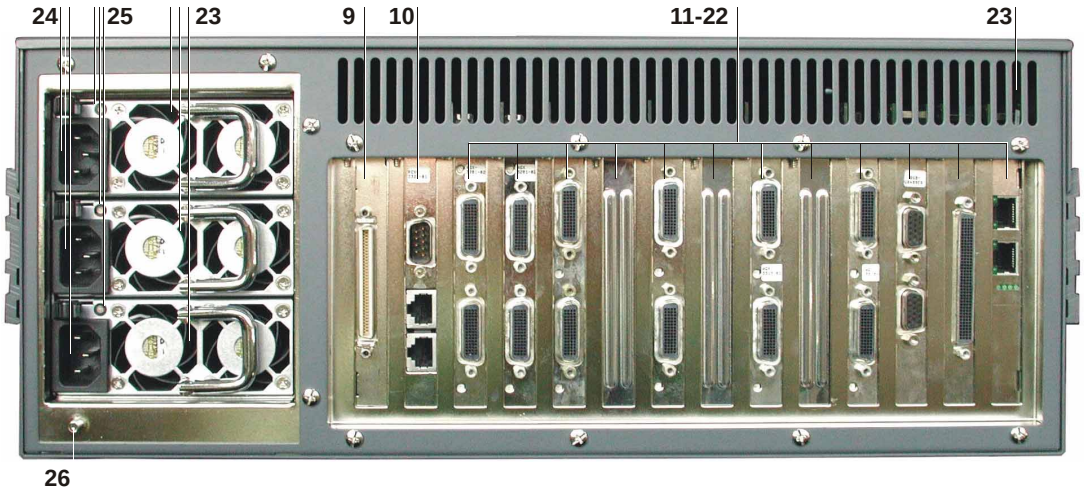


1	ventilation flap with air supply	
2	lock of ventilation flap	
3	On/Off-switch	
4	green LED: power on	
	on	power is switched on
	off	power is switched off
5	buzzer reset button: power module failed	
6	red LED: standby / component failed	
	on	standby mode: Power applies at the device but it is not switched on.
	off	device is switched on, no component failed **or** device is off, no power applies
	blinking	Component failure detected (e.g. one power module failed, fan failed, over-temperature in the device detected), the LED stops blinking when the component fail disappears.
7	front flap	
8	lock of front flap	

Figure 3-7
Front view of OMNIBUS A12

Behind the front flap of the OMNIBUS A12 on the lowest position, there is the **On/Off**-switch [3]. On the top position is a **buzzer reset button** [5] to confirm the failure of a redundant power module. Between these two buttons there are two LED's; the green LED **power on** [4] to the left is indicating if power is on. The red LED **standby / component failed** [6] to the right indicates that a redundant power module is not operable.

The back



9	link interface card	
10	CPU board	
11-22	Barco's expansion cards	
23	ventilation slots	
24	mains connection of power module	
25	LED: power status of power module	
	permanent red	standby mode: Power applies at the module but the device is not switched on.
	permanent green	power module OK, power output OK
	off	power connection is interrupted
26	connection for equipotential bonding conductor	

Figure 3-8
Rear view of OMNIBUS A12

In total there are 14 card slots visible from the back, with the left two positions having a fixed assignment for the **link interface card** [9] and the **CPU board** [10]. **Graphic cards**, **OmniScalers** and **input cards** [11-22] follow, depending on the configuration of TRANSFORM A.

On the left there are three power modules each with a **mains connection** [24] and an LED to indicate the **power status** [25]. On the lower part there is a **connection for the equipotential bondig conductor** [26].

To disconnect the OMNIBUS A12 from the power supply all power cords have to be pulled of the mains connection [24]. Therefore the back panel has to be easily accessible!

To protect the OMNIBUS A12 from overheating, the air supply openings in the case shall be kept free of obstructions!

To ensure power redundancy take care to connect each of the power modules to an independent power net.

The expansion slots

The OMNIBUS A12 provides 12 PCI slots [11-22] for insertion of UGX GRAPHIC CARD, OMNISCALER, QUAD ANALOG VIDEO CARD, DUAL DVI INPUT CARD, DUAL RGB INPUT CARD, QUAD SDI VIDEO CARD and STREAMING VIDEO CARD.

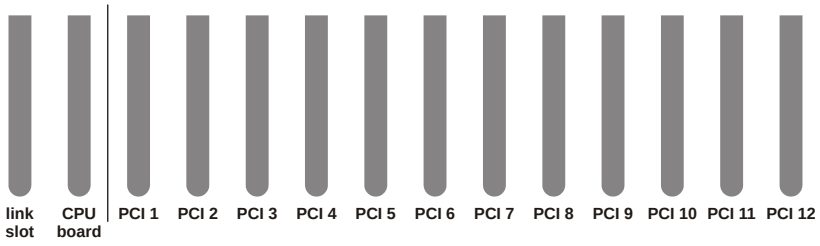


Figure 3-9
numbering of slots on the back panel of OMNIBUS A12

Connector **CPU board** is reserved for the CPU board and connector **link slot** is reserved for the connection to PROCESSOR. In the following sections reference is taken to the numbering of the PCI slots 1 – 12.

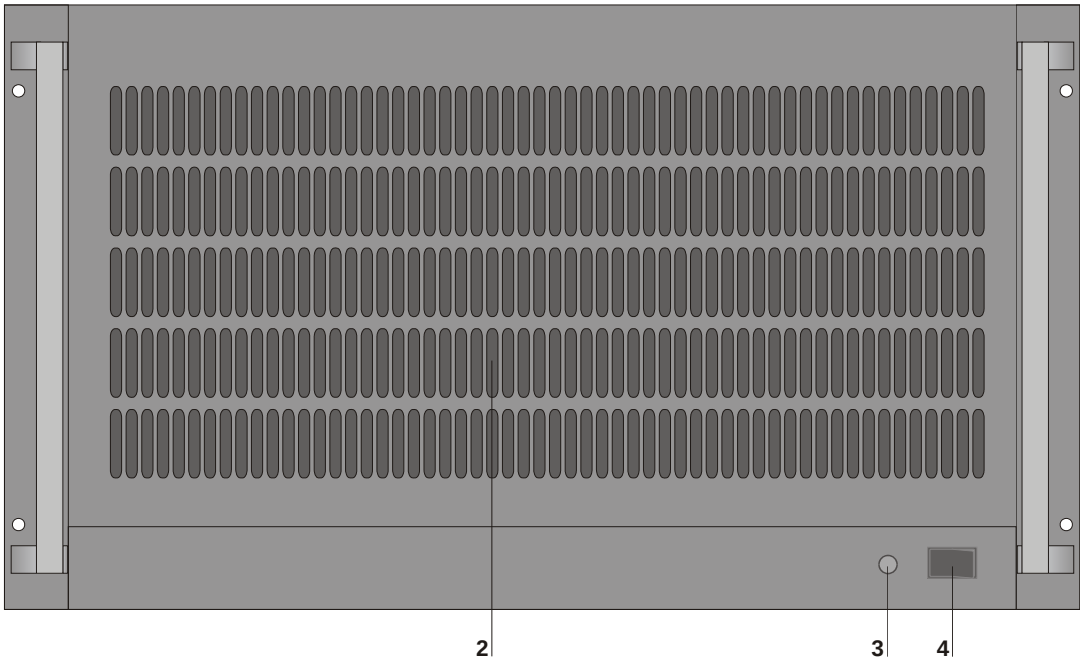
3.1.3 OmniBus A18

Each OmniBus A18 provides eighteen PCI expansion slots. They can be used for Barco's UGX or AGX Graphic Cards, OmniScalers, Quad Analog Video Cards, Dual DVI Input Card, Dual RGB Input Cards, Streaming Video Cards and Quad SDI Video Cards.

Although the backplane of the OmniBus A18 is based on standard 64bit/66MHz PCI bus it is highly recommended to not insert other cards than those mentioned above.

Other cards will not work due to the missing driver support and there is also a risk to damage the OmniBus A18 or the inserted cards.

The front



2	Ventilation flap with air supply	
3	LED: operating status	
	off	**power switch** [26] on the back switched off
	red	**power switch** [26] switched on, system in stand-by
	green	**power switch** [26] switched on, OmniBus A18 is started, either by the **On/Off push button** [4] or via the remote power cable by the Processor. All power modules that are currently in the OmniBus A18 are working well.
	red blinking	• Power failure at one power module (only with redundant power supplies) • One housing fan runs too slow or not at all • Overtemperature at temperature sensors on the backplane or CPU board.
4	Push button On/Off	

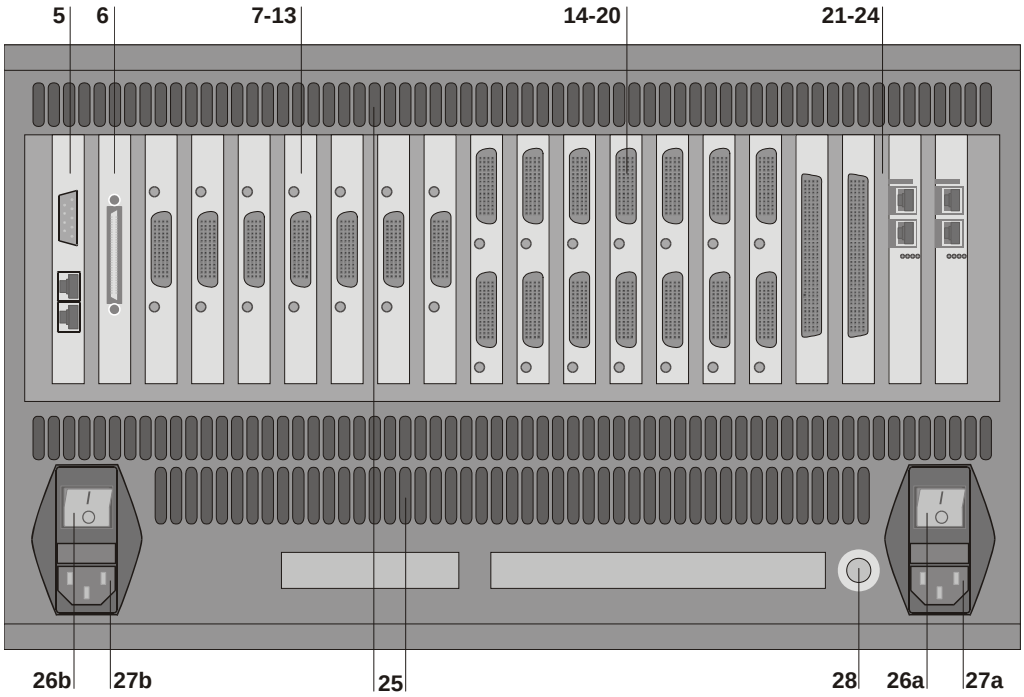
Figure 3-10
Front of the OmniBus A18

On the front of the OmniBus at the bottom to the right there is the **On/Off push button** [4]. Next to it there is an **LED** [3], showing the operating status of the OmniBus A18.

In an OmniBus A18 with redundant power supply the LED [3] also lights up green, if one of the two power modules is removed but the remaining power module is working well.

It is not an indicator that redundancy is available!

The back



5	CPU board
6	link interface card
7-13	Barco expansion cards, e.g. graphic cards
14-20	Barco expansion cards, e.g. OMNISCALER
21-24	Barco expansion cards, e.g. input cards
25	air supply
26a, 26b	power switch (**a** standard power module, **b** optional redundant power module)
27a, 27b	mains connection (**a** standard power module, **b** optional redundant power module)
28	connection for equipotential bonding conductor

Figure 3-11
back of OMNIBUS A18

On the upper part of the back of the OMNIBUS A18 there are different cards. On the left there is the **CPU board** [5] and the **link interface board** [6], followed by **graphic cards**, **OMNISCALERS** and **input cards** [7-24] depending on the configuration of TRANSFORM A.

On the right of the lower part is the standard **mains connection** [27a] and the **power switch** [26a]. On the left side there might be another **mains connection** [27b] and the **power switch** [26b] for a second power module for redundant operation, depending on the configuration of the TRANSFORM A. To the left of the standard mains connection there might be a **connection for the equipotential bondig conductor** [28].

To protect the OMNIBUS A18 from overheating, the air supply openings in the case shall be kept free of obstructions!

To disconnect the OMNIBUS A18 from the power supply all power cords have to be pulled of the mains connection [27a] and [27b]. Therefore the back panel has to be easily accessible!

The expansion slots

The OMNIBUS A18 provides 18 PCI slots [7-24] for insertion of UGX or AGX GRAPHIC CARDS, OMNISCALER, QUAD ANALOG VIDEO CARD, DUAL DVI INPUT CARD, DUAL RGB INPUT CARD, QUAD SDI VIDEO CARD and STREAMING VIDEO CARD.

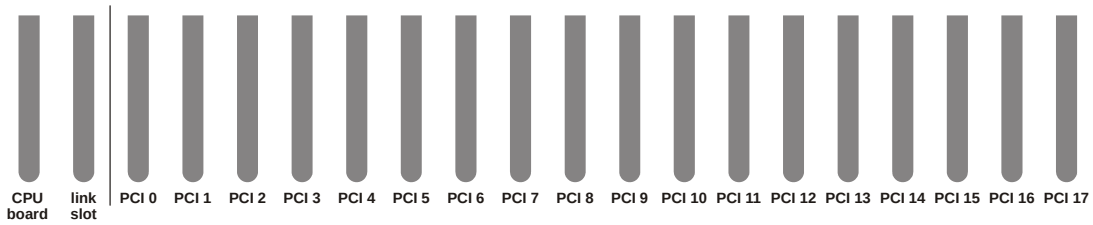


Figure 3-12
numbering of slots on the back panel of OMNIBUS A18

Connector **CPU board** is reserved for the CPU board and connector **link slot** is reserved for the connection to PROCESSOR. In the following sections reference is taken to the numbering of the PCI slots 0 – 17.

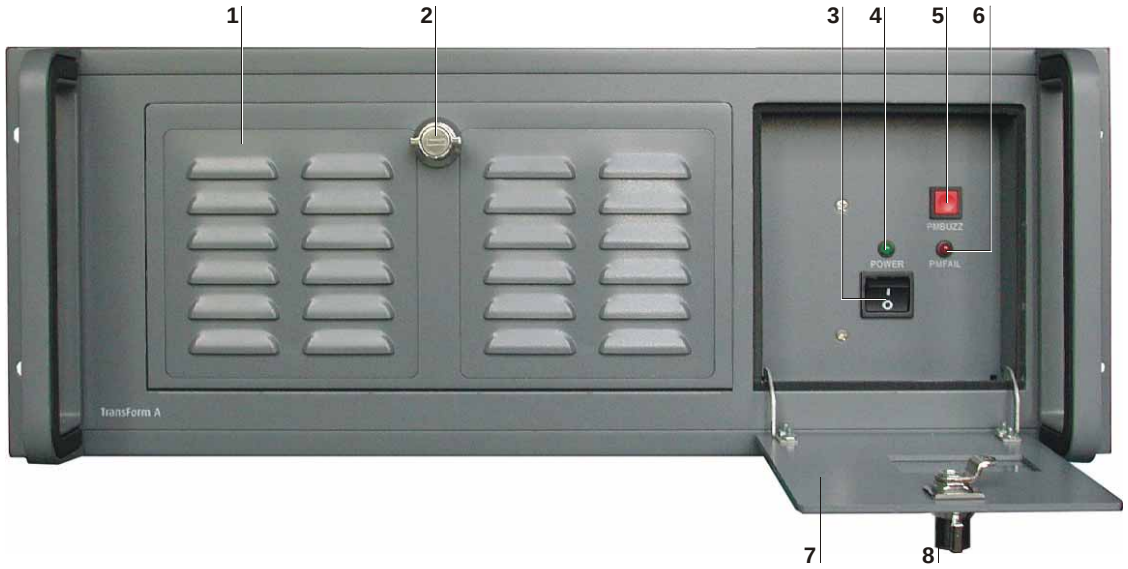
3.1.4 Extender

In a typical Processor configuration the PCI slots of the PROCESSOR are used for inserting all expansion cards. The EXTENDER extends the PROCESSOR by adding 13 PCI slots. Thus a bigger number of projection modules or more input sources can be connected in a Processor configuration. The EXTENDER is equipped with a redundant hot plug power supply.

Small systems, which exceed the number of available slots in the PROCESSOR can either be configured as an Omni-Bus configuration or as a Processor configuration with an EXTENDER, if the input requirements are moderate and the slots of an EXTENDER sufficient.

The front

The EXTENDER looks like this or similar:

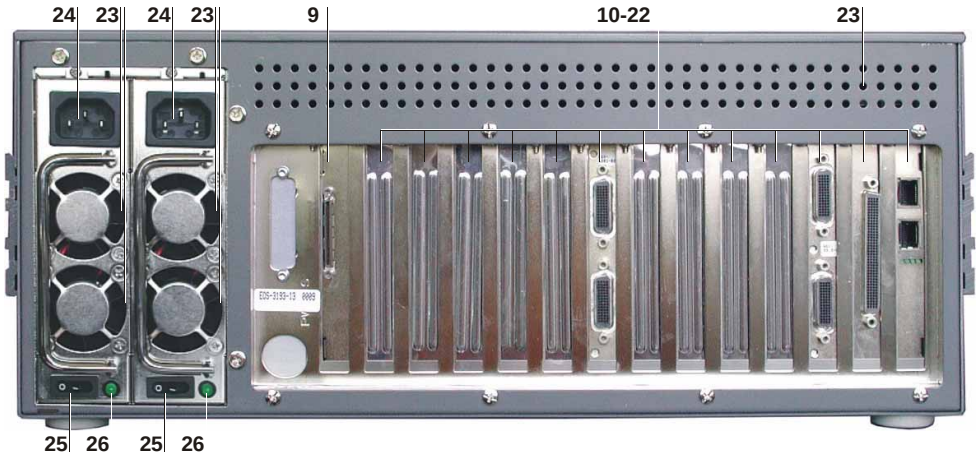


1	ventilation flap with air supply	
2	lock of ventilation flap	
3	On/Off-switch	
4	green LED: power on	
	on	power is switched on
	off	power is switched off
5	buzzer reset button: power module failed	
6	red LED: power module failed	
	on	One power module has failed or power connection to a module is interrupted.
	off	device is switched on, power modules OK, power output OK **or** device is off, no power applies
7	front flap	
8	lock of front flap	

Figure 3-13
Front view of the EXTENDER

On the front of the EXTENDER behind the front flap [7] on the lowest position, there is the **On/Off**-switch [3]. On the top position is a **buzzer reset button** [5] to confirm the failure of a redundant power module. Between these two buttons there are two LED's, the green LED **power on** [4] to the left is indicating if power is on. The red LED **power module failed** [6] to the right indicates that a redundant power module is not operable.

The back



9	link interface card
10-22	slots for Barco's expansion cards
23	ventilation slots
24	mains connection
25	power switch of power modules
26	green LED: individual power module operating

Figure 3-14
rear view of EXTENDER

In total there are 14 card slots visible from the back, with the most left position having a fixed assignment for the **link interface card** [9]. **Graphic cards**, **OmniScalers** and **input cards** [10-22] follow, depending on the configuration of TRANSFORM A.

On the left there is the power supply with the **mains connection** [24]. Each power module has an individual **power switche** [25] and a **green LED** [26] that indicates the operation of the power module.

The expansion slots

The EXTENDER provides 13 PCI slots in two PCI segments:

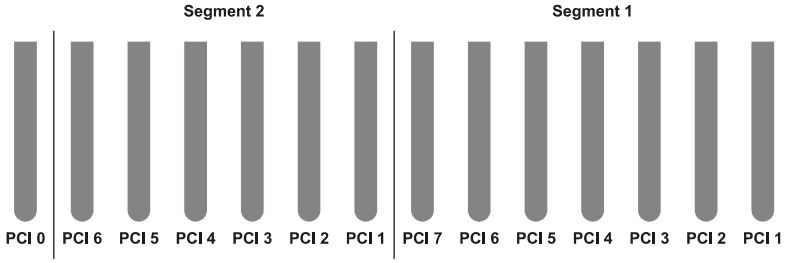


Figure 3-15
PCI Slots and Segments

Connector **PCI 0** is reserved for the link interface card to connect to the PROCESSOR.

3.2 Cabling

3.2.1 Power supply

Check the power rating on your outlet before connecting the devices of TRANSFORM A to the wall outlet or to a power strip. Contact your facilities manager or a qualified electrician if you are not sure what type of power is supplied to your building.

TRANSFORM A is designed to operate with single-phase power systems having a grounded neutral conductor. To reduce the risk of electrical shock, do not plug into any other type of power system.

To connect PROCESSOR, OMNIBUS devices or EXTENDERS to the power supply, follow these steps:

- If using an OMNIBUS with redundant power supply first connect an equipotential bondig conductor to the connector [28] (Figure 3-11) at an OMNIBUS A18 and connector [26] (Figure 3-8) at an OMNIBUS A12 respectively.
- Plug the female end of the power cords into the mains connections of each PROCESSOR [25] (Figure 3-5), OMNIBUS A12 [24], OMNIBUS A18 [27] and EXTENDER [24] (Figure 3-14) respectively.

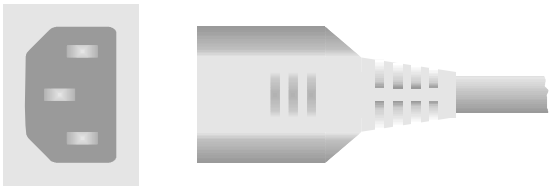


Figure 3-16
Mains connection

- Plug the male end of each power cord into a power outlet.

3.2.2 Mouse

The standard mouse is a USB optical mouse with a PS/2 adapter. Either plug it with its PS/2 adapter into the **PS/2 mouse** jack [26] or plug USB connector into one of the **USB jacks** [28] of the PROCESSOR.

Figure 3-17
mouse connection via PS/2 (left) and via USB (right)

3.2.3 Keyboard

The standard keyboard is a **USB keyboard**. Plug it into one of the **USB jacks** [28] of the PROCESSOR.

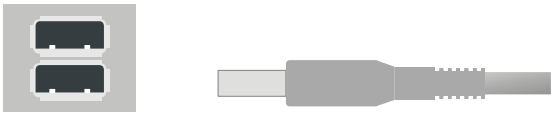


Figure 3-18
keyboard connection via USB

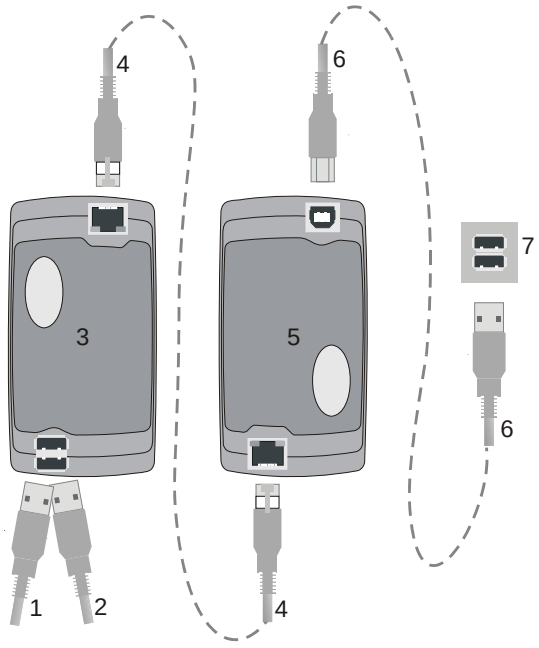
3.2.4 Keyboard extension

The keyboard extension allows a distant positioning of keyboard and mouse.

The figure below shows schematically the parts and the cabling of the keyboard extension.

The keyboard extension is made up of two extension boxes (**remote extension box REX** [3], **local extension box LEX** [5]) and two connection cables (**RJ-45 connection cable 20m** [4], **USB cable** [6]). Keyboard and mouse are plugged into the **remote extension box** instead of being plugged directly into the PROCESSOR. The **remote extension box** is connected to the **local extension box** with the **connection cable 20m**.

The **local extension box** is connected to an **USB port** of the PROCESSOR with the provided **USB cable**, which has on the one end a USB-A plug and on the other a USB-B plug.



1	mouse
2	keyboard
3	remote extension box REX
4	RJ-45 connection cable 20 m (or optionally 50 m)
5	local extension box LEX
6	USB cable
7	USB jacks at the back of the PROCESSOR

Figure 3-19
USB Keyboard extension

The RJ-45 connection cable is not meant to connect REX and LEX via a network. The RJ-45 connectors of LEX and REX must be connected directly with each other!

3.2.5 Graphic cards

The DDC capable UGX GRAPHIC CARDS provide the facility for connecting Barco projection modules (digital mode) or for connecting CRT monitors or projectors (analog mode) to TRANSFORM A. By means of a rotary switch on the boards it can easily be switched to the appropriate mode. For digital output, resolutions up to 1920x1200 can be processed.

For TRANSFORM A systems with digital output and video or RGB insertions the output of the graphic cards is led over to OMNISCALERS and then connected to the display device. Please refer to section 3.2.6 OmniScaler.

Connectors

The UGX GRAPHIC CARD provides two Dual-DVI connectors to connect four display devices.

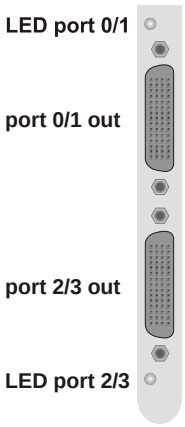


Figure 3-20
Ports of UGX GRAPHIC CARD

DDC capable display devices must be connected to the graphic cards before TransForm A is switched on. If they are connected afterwards, TransForm A will not be able to detect them!

Specifications

For detailed technical specifications of the graphic cards please refer to section 7.1 Technical data.

Adapter cables

Depending on the configuration the card is delivered with different adapter cables:

- **Dual-DVI to 2×DVI-D adapter cable:**
  Digital output for display on projection modules with digital input.

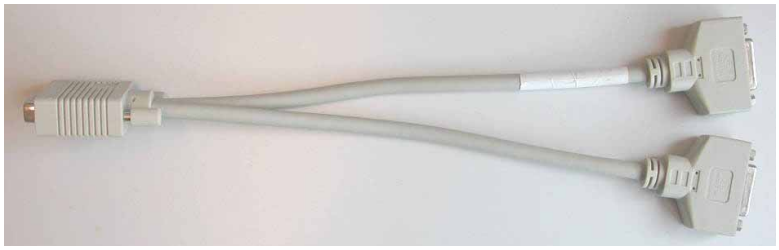


Figure 3-21
Dual-DVI to 2×DVI-D adapter cable

- **Dual-DVI to 2×CRT adapter cable:**
  Analog output for display on projection modules with analog input.

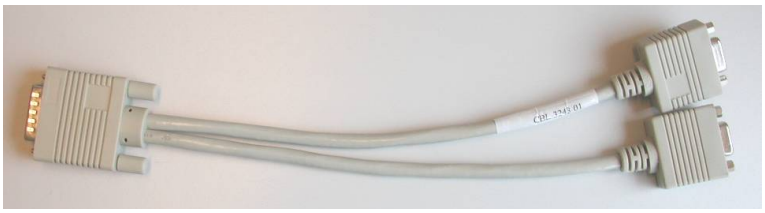


Figure 3-22
Dual-DVI to 2×CRT adapter cable

Order

The first graphic card in respect to PCI slot numbering identifies itself as primary graphic adapter by lighting the green LED of the respective graphic channel when TransForm A is switched on. The primary graphic adapter is the channel, where the system emits diagnostic and status messages during system startup.

- **In an OmniBus configuration** the graphic cards are plugged into the OmniBus devices. For the explicit order of the graphic cards, please refer to the section 3.2.15 OmniBus.
- **In a Processor configuration** graphic cards are in most cases plugged in the Processor. If multiple graphic cards are used the other graphic cards should be inserted in sequence to the primary graphic adapter into the PCI slots and are numbered consequently following their numbering. Please refer also to section 3.2.16 Extender.

Each UGX Graphic Card provides four ports for connecting projection cubes, monitors or projectors. The upper connector contains **port 0** and **1**, the lower one contains **port 2** and **3**. Thus the sequence of the graphic channels is:

board	1				2				3			
port	0	1	2	3	0	1	2	3	0	1	2	3
channel	1	2	3	4	5	6	7	8	9	10	11	12

Figure 3-23

As default the OverView projection cubes and graphic channels are assigned in columns from top to bottom starting with the left column (view from front of the screens). Please refer to section 3.5.3 Configuring the display wall for further details.

3.2.6 OmniScaler

In addition to graphic cards, also OMNISCALERS are a substantial part of TRANSFORM A to connect to projection modules. OMNISCALERS provide the ability to integrate video and RGB data into the graphical data from the graphic cards. Therefore the **out** connector of the graphic card needs to be connected to the **in** connector of the OMNISCALER. Only graphic cards in digital mode can be connected. DDC information from the projection device is looped through to the graphic card for further processing.

Connectors

The OMNISCALER provides one Dual-DVI connector for data insertion from the graphic card and one Dual-DVI connector for digital output for two projection modules.

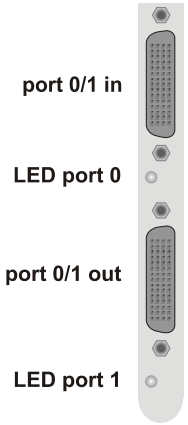


Figure 3-24
ports of the OMNISCALER

In every OMNISCALER card package a Dual-DVI to Dual-DVI cable is included. It serves to connect **port 0/1 in** of the OMNISCALER with **port 0/1** or **port 2/3** of the graphic card:

Figure 3-25
Dual-DVI to Dual-DVI adapter cable

For the connection to the projection modules the Dual-DVI to 2×DVI-D adapter cable that was provided with the graphic card is used. It must be plugged into **port 0/1 out** of the OMNISCALER.

Order

On the OMNISCALER that is connected to the first graphic card (as primary graphic adapter) also the green LED of the respective graphic channel is lighting.

- **In an OmniBus configuration** the OMNISCALERS are inserted into the PCI slots of the OMNIBUS devices, please refer to section 3.2.15 OmniBus.
- **In a Processor configuration** the OMNISCALERS might be inserted in the PCI slots of the PROCESSOR or the EXTENDER. If more than one OMNISCALER is built-in, they are numbered in the sequence of the PCI slots, please refer to section 3.2.16 Extender.

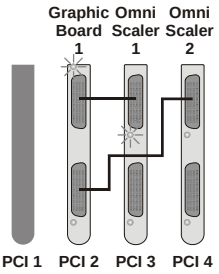


Figure 3-26
Example for connecting OMNISCALERS with the graphic card in a PROCESSOR AGS-3389

Specifications

For detailed technical specifications of the OMNISCALERS please refer to section 7.1 Technical data.

3.2.7 Quad Analog Video Card

The QUAD ANALOG VIDEO CARD provides the capability of displaying video signals like VCR, TV, CCTV etc. The analog video signals are digitized for further processing in TRANSFORM A. Four video signals per QUAD ANALOG VIDEO CARD can be processed simultaneously.

Standard

The video standard Composite Video (VHS, FBAS, CVBS, CVS, Y) is supported.

Connectors

The QUAD ANALOG VIDEO CARD provides four BNC connectors for video insertion.

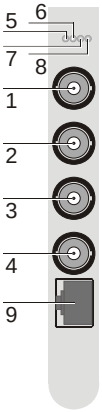


Figure 3-27
connectors of QUAD ANALOG VIDEO CARD

1	video channel 1
2	video channel 2
3	video channel 3
4	video channel 4
5	green LED channel 1
6	green LED channel 2
7	green LED channel 3
8	green LED channel 4
9	RJ45 GPIO connector (*reserved*)

Table 3-1
channels of the QUAD ANALOG VIDEO CARD

Order

Within a single QUAD ANALOG VIDEO CARD the numbering of the video channels is as shown in the figure above. The order in that the input cards are inserted into TRANSFORM A is as follows:

- **In an OmniBus configuration** the input cards are plugged into the PCI slots of the OMNIBUS devices, please refer to section 3.2.15 OmniBus.
- **In a Processor configuration** the input cards are inserted into the PCI slots following the OMNISCALERS. If more than one input card is built-in, they are numbered in the sequence of the PCI slots, please refer to section 3.2.16 Extender.

Specifications

For detailed technical specifications of the QUAD ANALOG VIDEO CARD please refer to section 7.1 Technical data.

3.2.8 Streaming Video Card

The STREAMING VIDEO CARD provides the capability of displaying compressed encoded digital video streams. The digital signal is decoded for further processing in TRANSFORM A. Up to four video streams can be processed simultaneously. The STREAMING VIDEO CARD allows a redundant connection to the Ethernet. The card exists in three different versions: STREAMING VIDEO CARD SVC-1, STREAMING VIDEO CARD SVC-2 and STREAMING VIDEO CARD J2K.

Standard

The STREAMING VIDEO CARD supports the following stream types over Ethernet:

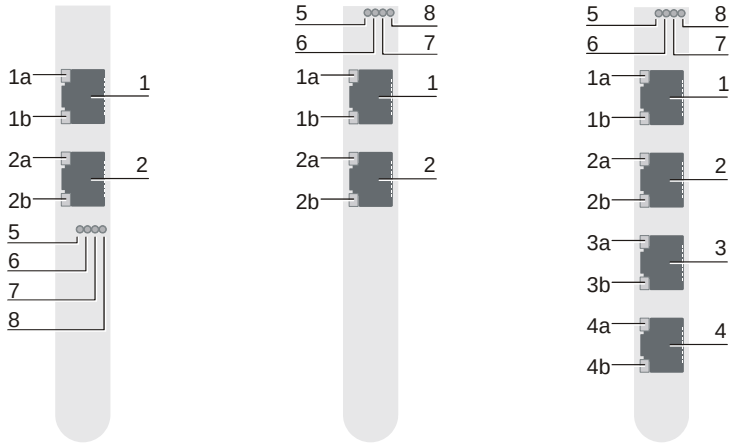
type	supported stream types
STREAMING VIDEO CARD SVC-1	MPEG-2, MPEG-4, MJPEG, MxPEG, 2D-Wavelet and TRANSFORM SCN streams
STREAMING VIDEO CARD SVC-2	MPEG-2, MPEG-4 and visiowave streams
STREAMING VIDEO CARD J2K	JPEG2000 video streams

Table 3-2
Supported stream types of STREAMING VIDEO CARD

Connectors

The STREAMING VIDEO CARD provides two RJ45 connectors to establish the connection to the network. For a redundant connection a network cable should be plugged into each of the plugs [1] and [2]. These network cables should connect on the other side to a redundant network. In case of a failure of one connection the other connection will take over the complete network traffic. If a redundant connection is not required either plug [1] or plug [2] can be used for the connection. Both plugs use the same IP and MAC address, so no configuration in regard of the used plug is required.

The STREAMING VIDEO CARD J2K provides two more RJ45 connectors. They enable to connect the card to a video network and an independent control network. Also these two connectors enable redundant connection.



1	RJ45 Network connector 1 video network (10/100Mbps on SVC-1, 100/1000Mbps on SVC-2 / J2K)
2	RJ45 Network connector 2 video network (10/100Mbps on SVC-1, 100/1000Mbps on SVC-2 / J2K)
3	RJ45 Network connector 3 control network (10/100Mbps)
4	RJ45 Network connector 4 control network (10/100Mbps)
a	green LED: ON – connected to the Ethernet
b	green LED: ON – connected with 100 Mbps (SVC-1, J2K-control) / 1000 Mbps (SVC-2, J2K-video) OFF – connected with 10 Mbps (SVC-1, J2K-control) / 100 Mbps (SVC-2, J2K-video)
5	stream 1 is active
6	stream 2 is active
7	stream 3 is active
8	stream 4 is active

Figure 3-28
connectors of the STREAMING VIDEO CARD – SVC-1 (left), SVC-2 (middle), J2K (right)

Order

For the order in that the input cards are inserted into TRANSFORM A, please see section 3.2.7 Quad Analog Video Card.

Specifications

For detailed technical specifications of the STREAMING VIDEO CARD please refer to section 7.1 Technical data.

3.2.9 Quad SDI Video Card

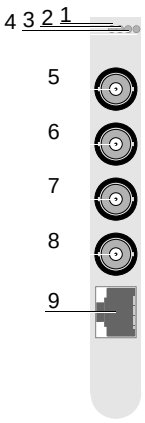
The QUAD SDI VIDEO CARD provides the capability of displaying SDI video signals. The digital video signals are processed for further usage in TRANSFORM A. Four video signals per QUAD SDI VIDEO CARD can be processed simultaneously.

Standards

The QUAD SDI VIDEO CARD supports the standard SMPTE 259M-C (4:2:2, 270Mbps only).

Connectors

The QUAD SDI VIDEO CARD has four BNC connectors to connect four SDI sources. To each input there is a LED associated.



1	green LED channel 1
2	green LED channel 2
3	green LED channel 3
4	green LED channel 4
5	SDI input channel 1
6	SDI input channel 2
7	SDI input channel 3
8	SDI input channel 4
9	*not used*

Figure 3-29
connectors of the QUAD SDI VIDEO CARD

Order

For the order in that the input cards are inserted into TRANSFORM A, please see section 3.2.7 Quad Analog Video Card.

Specifications

For detailed technical specifications of the QUAD SDI VIDEO CARD please refer to section 7.1 Technical data.

3.2.10 Dual DVI Input Card

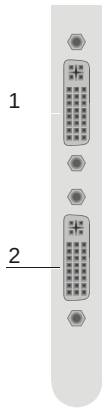
The DUAL DVI INPUT CARD provides the capability of displaying video or RGB signals provided as digital or analog data. Either two signals up to 165 MHz pixel clock (e.g. 1920×1080@60Hz) or one signal up to 330 MHz pixel clock (e.g. 2048×2048@60Hz) can be captured for further processing in TRANSFORM A.

Standard

The input formats SDTV analog, HDTV analog and digital, and RGB analog and digital (DVI-D) are supported.

Connectors

The DUAL DVI INPUT CARD has two DVI-I connectors. Each is for connecting one input signal to TRANSFORM A. The upper one, **In 1**, is a dual link DVI-I connector, which must be used, if a high-resolution signal is applied that uses dual link. **In 1** is also the connector that is used to connect a signal in single input mode.



1	input channel 1 DVI-I dual link
2	input channel 2 DVI-I

Figure 3-30
connector of DUAL DVI INPUT CARD

Adapter cables

For the connection of the variety of supported source signal types to the DVI-I connectors of the card a range of dedicated cables and adapters is optionally available.

Digital signals:	
DVI-D single link	copper or optical DVI-D <–> DVI-D cable, see section 7.3 Order codes
DVI-D dual link	suitable copper or optical DVI-D dual link cable, in doubt contact the customer support: 8.3 Contact. The cable must be connected to **In 1**.
HDMI single link	HDMI to DVI-D adapter, see section 7.3 Order codes
Analog signals:	
HD15 connectors	HD15 – > DVI-A adapter, see section 7.3 Order codes. Two adapters are in the scope of delivery
RCA connectors	3×RCA to DVI-A adapter cable, see section 7.3 Order codes and for connection below
BNC connectors	5×BNC to DVI-A adapter, see section 7.3 Order codes and for connection below

Table 3-3
Adapters and cables for DUAL DVI INPUT CARD

The connection of analog signals is according to the table below:

Color of wire	RGB	Composite Y	S-Video YC	Component YPrPb
red	R	Y	Y	Pr
green	G	–	–	Y
blue	B	–	C	Pb
black (only on BNC adapter cable)	V-SYNC	–	–	–
gray (only on BNC adapter cable)	H-SYNC	–	–	–

Table 3-4
Connection of analog signals to DUAL DVI INPUT CARD

Order

Within a single DUAL DVI INPUT CARD the numbering of the video channels is as shown in the figure above. For the order in that the input cards are inserted into TRANSFORM A, please see section 3.2.7 Quad Analog Video Card.

Specifications

For detailed technical specifications of the DUAL DVI INPUT CARD please refer to section 7.1 Technical data.

3.2.11 Dual RGB Input Card

The DUAL RGB INPUT CARD provides the capability of displaying RGB monitor signals. Two analog signals up to 1280×1024@75Hz are digitized for further processing in TRANSFORM A.

Standard

The synchronization modes **Hsync+Vsync**, **Csync** and **Sync-on-Green** are supported.

Connectors

The DUAL RGB INPUT CARD has two VGA compatible 15-pin SubMinD connectors. Each is for connecting one RGB signal to TRANSFORM A.

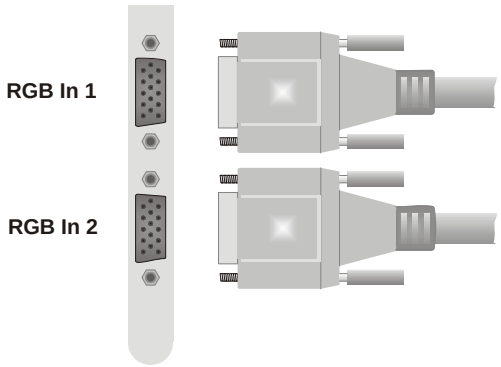


Figure 3-31
connector of DUAL RGB INPUT CARD

Order

Within a single DUAL RGB INPUT CARD the numbering of the video channels is as shown in the figure above. For the order in that the input cards are inserted into TRANSFORM A, please see section 3.2.7 Quad Analog Video Card.

Specifications

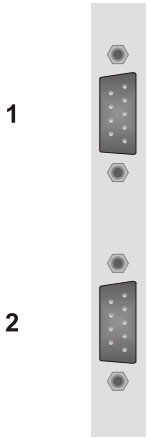
For detailed technical specifications of the DUAL RGB INPUT CARD please refer to section 7.1 Technical data.

3.2.12 Multiport I/O Card

The Multiport I/O Card extends the system with additional serial connectors. They might be helpful for controlling multiple devices through Barco's Wall Management Software APOLLO.

Connectors

The Multiport I/O Card has two serial sockets.



1	1st serial port
2	2nd serial port

Figure 3-32
Multiport I/O Card

Order

The Multiport I/O Card must be inserted into one of the PCI slots of the PROCESSOR. Up to three Multiport I/O Cards can be used in a PROCESSOR.

Inserting a Multiport I/O Card in an OmniBus or Extender is not supported!

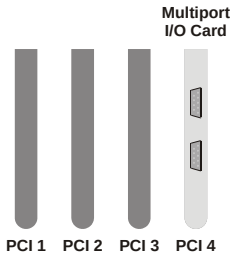


Figure 3-33
Position of Multiport I/O Card in an PROCESSOR AGS-3389

3.2.13 Network

LAN

For connecting the PROCESSOR to the LAN (local area network) there are different network cards and an onboard LAN adapter available:

- Onboard LAN Adapter
- Ethernet Card 100 Mbps, PCI
- Ethernet Card 1000 Mbps, PCI
- Ethernet Card 1000 Mbps, PCIe

The onboard LAN adapter and the Ethernet Cards 1000 Mbps have the ability to establish a 10 Mbps, 100 Mbps or 1000 Mbps connection. The Ethernet Card 100 Mbps has the ability to establish a 10 Mbps or 100 Mbps connection.

For a redundant connection to the LAN also server adapters are available, allowing configuring them in teaming mode, sharing one single IP-address. You can see whether a network card is of server or desktop type on the label on the card. With a PROCESSOR **AGS-3390-1/-2** also the two onboard LAN adapters – [32a] and [32b] – can be used to establish a redundant network connection. Please refer also to section 6.1.11 Redundant network adapter for more information.

The onboard LAN adapter, the 100 Mbps and the 1000 Mbps network cards offer each a Twisted Pair connection:

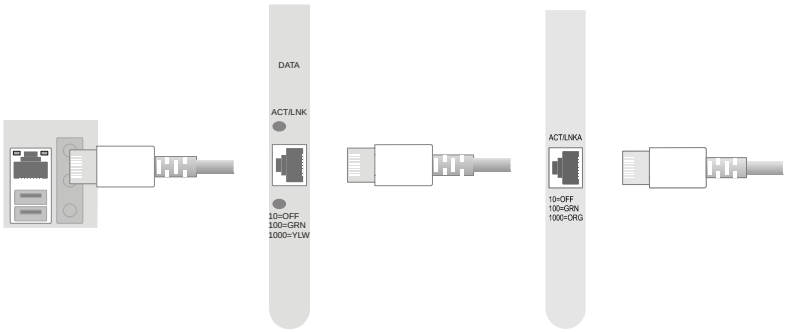


Figure 3-34
Connecting to Twisted Pair (RJ-45)
Onboard LAN adapter (left), 1000 Mbps Ethernet Card, PCI (middle) and 1000 Mbps Ethernet Card, PCIe (right)

Order

The PCI Express network card is inserted in the first PCIe x1 slot. A second PCI Express netwok card can be inserted into the PCIe x16 slot. The PCI network card is inserted in the PCI slot of the PROCESSOR with the highest number. If several network cards are used they are inserted consecutively.

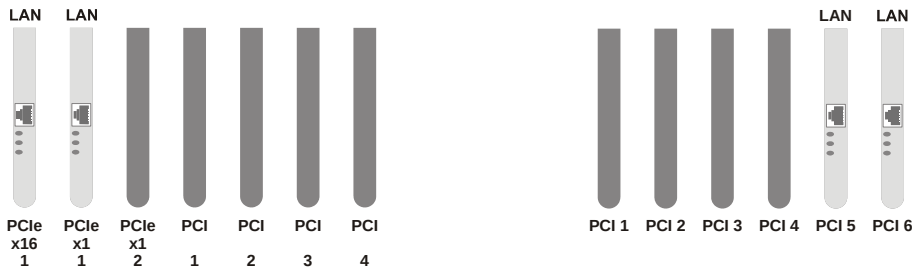


Figure 3-35
Network card in the PROCESSOR AGS-3389 (left) and PROCESSOR AGS-3328 (right)

Inserting a network card in an OmniBus or Extender is not supported!

3.2.14 CPU board

The CPU board controls amongst other the remote power on/off mechanism between PROCESSOR and the OMNIBUS devices and the transmission of a genlock signal. It is part of each OMNIBUS.

Connectors

On the CPU board there are two RJ-45 connectors for connecting the remote power on/off cables.

Do not remove the sheet metal plate. The connector behind is reserved for diagnostic purposes.

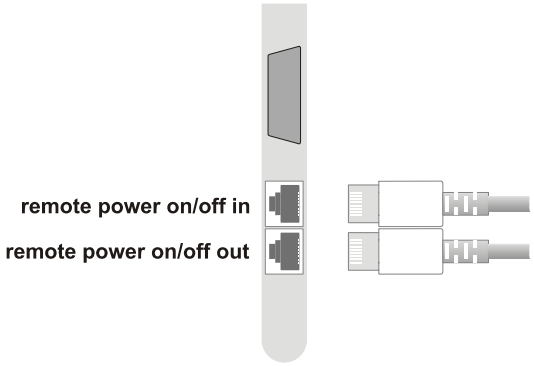


Figure 3-36
connectors of CPU board

Connecting order remote power on/off

All TRANSFORM A devices of an OmniBus configuration should be connected in a daisy chain for remote power on/off mechanism. Therefore the **remote power on/off** connector [16] on the back of the PROCESSOR must be connected with the **remote power on/off in** connector of the CPU board of the first OMNIBUS. The **remote power on/off out** connector of this OMNIBUS must be connected to the **remote power on/off in** connector of the next OMNIBUS and so on. The **remote power on/off out** connector of the last OMNIBUS remains unconnected.

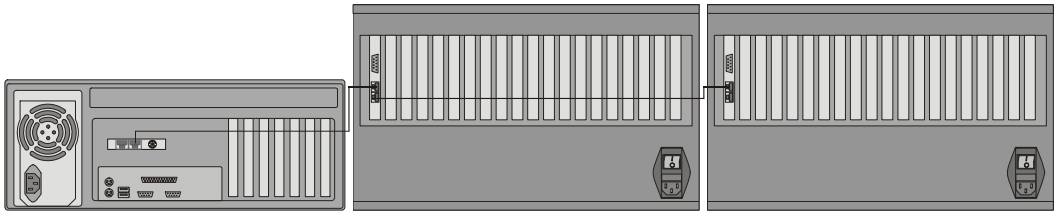


Figure 3-37
cabling for remote power on/off at OMNIBUS A18 devices

Do not mix up the connetors for remote power on/off with the mechanically identical connectors of the network adapters!

Mixing the connectores will cause damage to the system!

Connecting order remote power on/off and genlock

In general all OMNIBUS devices that are locked to the same source must be connected to each other by means of the **remote power on/off** cabling. In particular, if an external source is used for genlocking it must be connected to the **external genlock in** connector [17] on the back of the PROCESSOR.

If multiple TRANSFORM A systems shall be locked to the same source, the **remote power on/off out** connector of the last OMNIBUS must be connected to the **external genlock loop through in** connector [15] on the back of the PROCESSOR of the next TRANSFORM A system.

An example of cabling for an external genlock source is given in the figure below:

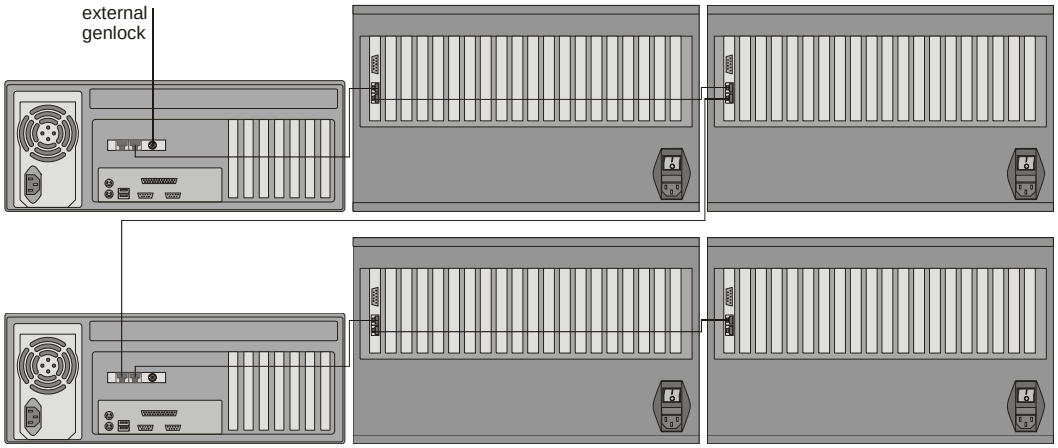


Figure 3-38
cabling for remote power on/off and external gunlock at OMNIBUS A18 devices

3.2.15 OmniBus

Connecting to the Processor

The data connection between PROCESSOR and OMNIBUS is established with a link interface cable. It connects the respective link interface card in the PROCESSOR [19-24] (Figure 3-5) with the link interface card in the OMNIBUS A12 [9] (Figure 3-8) and in the OMNIBUS A18 [6] (Figure 3-11) respectively with a round cable; please see the figure below.

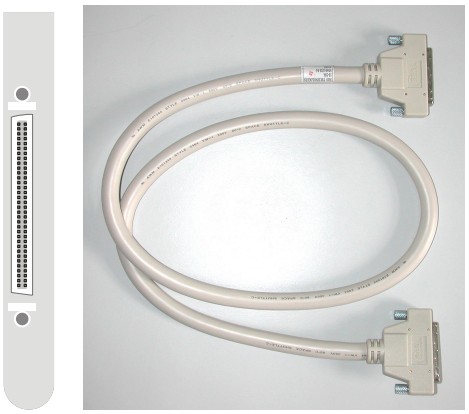


Figure 3-39
Link interface card with 68 pin mini-D connector (left) and round cable (right) for connection of PROCESSOR and OMNIBUS

The round cable between Processor and OmniBus is fragile. It may not last under tension, or being bent or twisted.

Connecting several OmniBus devices

In the PROCESSOR AGS-3389 there are four PCI slots for link interface cards available. With AGS-3328 or AGS-3390 five link interface cards can be used. The respective number of OMNIBUS devices can be connected to one PROCESSOR. Each OMNIBUS is connected in the manner explained above.

Order

The respective link interface cards are inserted in the PCI slots of the PROCESSOR following the network cards. If more than one OMNIBUS is connected, they are numbered in the sequence of the PCI slots.

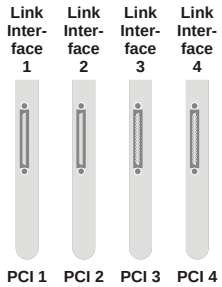


Figure 3-40
Link interface cards in a PROCESSOR AGS-3389 to connect to multiple OMNIBUS devices

The Processor expects the primary graphic adapter in the first OmniBus. Therefore the OmniBus that is connected to the link interface 1 must be equipped with graphic cards.

Order of graphic and input cards

The graphic cards are numbered consecutively with ascending PCI slots. Each OMNISCALER is numbered according to the graphic card it is connected to. The QUAD ANALOG VIDEO CARDS, STREAMING VIDEO CARDS, QUAD SDI VIDEO CARDS, DUAL DVI INPUT CARDS and DUAL RGB INPUT CARDS are numbered commonly with ascending PCI slots. The OMNIBUS devices themselves are taken into account in ascending order of their respective PCI slots in the PROCESSOR.

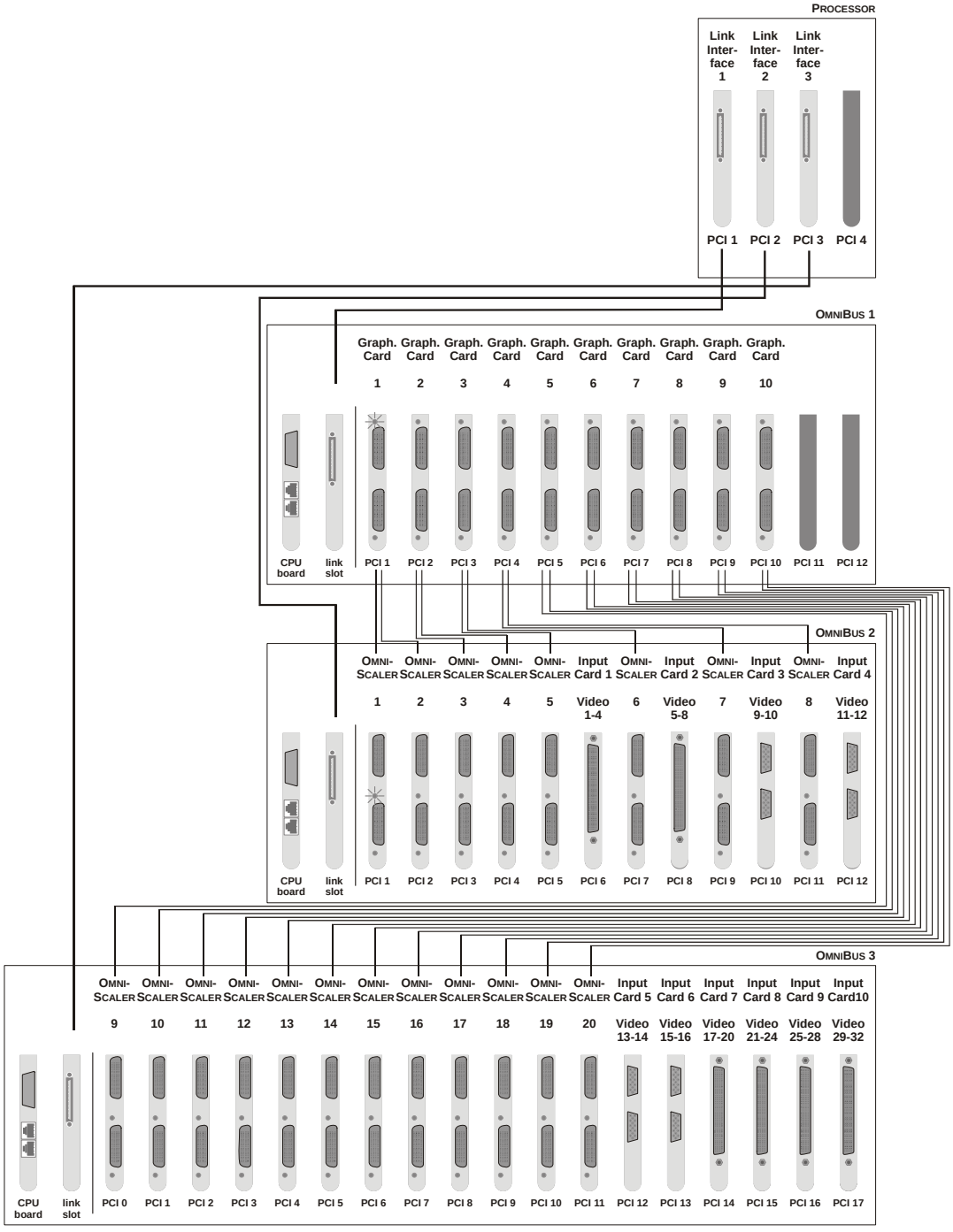


Figure 3-41
Example for the numbering in a configuration with three OMNIBUS devices and one PROCESSOR AGS-3389

3.2.16 Extender

Connecting to the Processor

The data connection between PROCESSOR and EXTENDER is established with a link interface card in the PROCESSOR and in the EXTENDER, which are connected with a round cable.

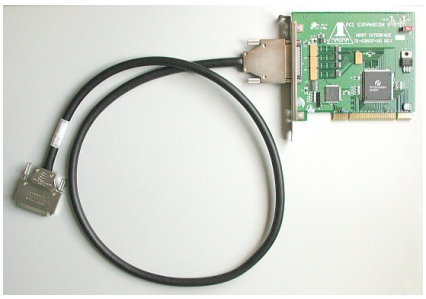


Figure 3-42
Round cable to connect PROCESSOR and EXTENDER

The cable between Processor and Extender is fragile. It may not last under tension, or being bent or twisted.

The link interface cards consume one PCI slot in the PROCESSOR and in the EXTENDER.

Order

The connection card is inserted in the PCI slot with the lowest numbers.

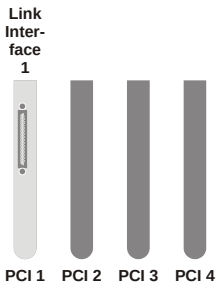


Figure 3-43
Connection card to the EXTENDER in a PROCESSOR AGS-3389

Order of graphic and input cards

In a Processor configuration with an EXTENDER the numbering of the graphic cards and QUAD ANALOG VIDEO CARDS, STREAMING VIDEO CARDS, QUAD SDI VIDEO CARDS, DUAL DVI INPUT CARDS and DUAL RGB INPUT CARDS follows the order implicitly given by the EXTENDER and its interconnection. The OMNISCALERS are numbered according to the graphic cards they are connected to.

Numbering begins at slot **PCI 1** of the PROCESSOR. As soon as an EXTENDER is connected, numbering continues with the PCI slots of this EXTENDER. After that the remaining slots of the PROCESSOR are numbered. The numbering is illustrated in the figure below.

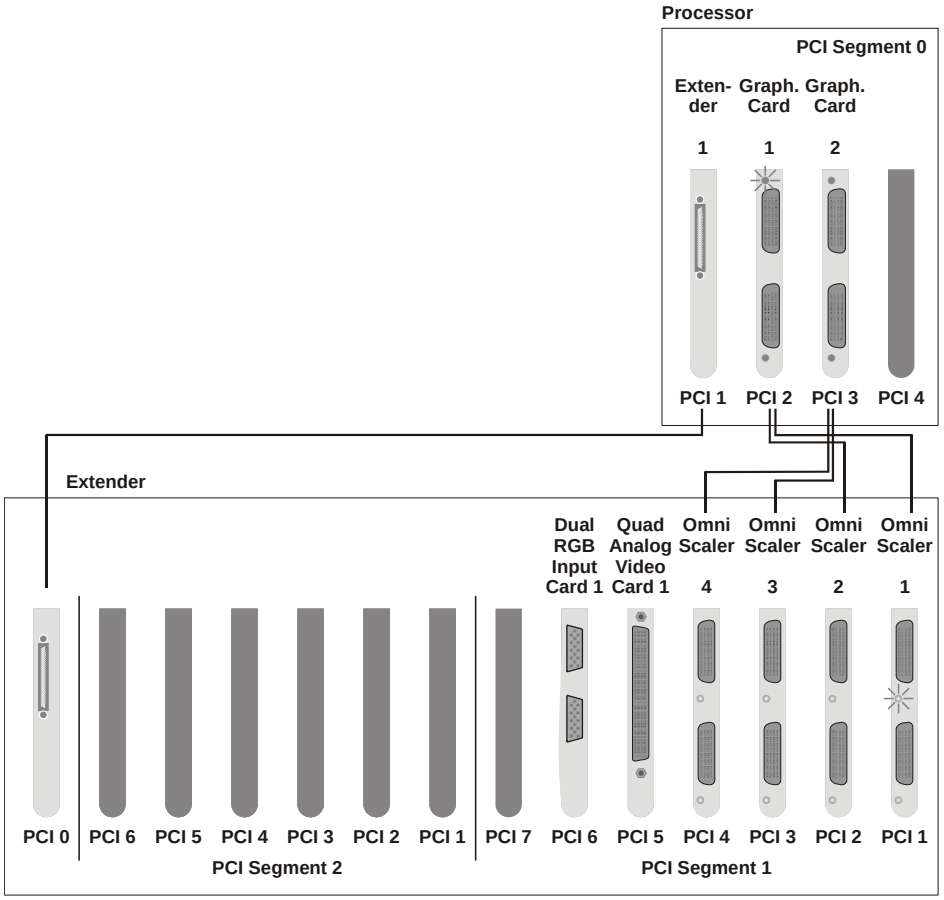


Figure 3-44
Example for the numbering in a configuration with an EXTENDER and a PROCESSOR AGS-3389

3.2.17 Example configurations

The examples below cover different kind of configurations to show the different possibilities of setups and connections. The following abbreviations are used:

- **G**: graphic card
- **O**: OMNISCALER
- **I**: input card, i.e. QUAD ANALOG VIDEO CARD, DUAL DVI INPUT CARD, DUAL RGB INPUT CARD, QUAD SDI VIDEO CARD or STREAMING VIDEO CARD

The schematic drawings of the TRANSFORM A devices show always the view on the back of a device. To keep it clearly arranged only the available PCI slots are plotted. The display wall is shown from the front!

Small system in Processor configuration

Below a sketch of a four-channel system with digital output and 4 free movable and scalable video windows in a Processor configuration using just the PROCESSOR:

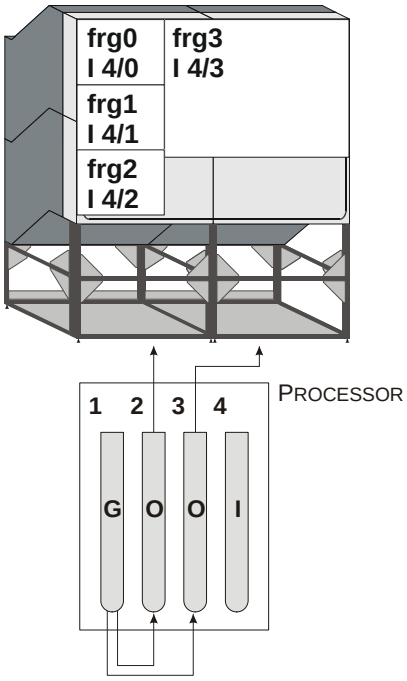


Figure 3-45
small system in Processor configuration

In our example all cards can be inserted into one PROCESSOR. A TRANSFORM A in Processor configuration is sufficient to control the wall.

Small system in OmniBus configuration

A system consisting of one PROCESSOR and one OMNIBUS A12 is the smallest possible system of an OmniBus configuration. Already this setup allows a system of 44 channels. On the other hand up to 40 videos can be displayed on a wall consisting of two channels. Lots of intermediate configurations are also possible. In this example there is a configuration shown, where the number of output channels and video sources is more balanced in an eight channel system with 24 freely movable video windows:

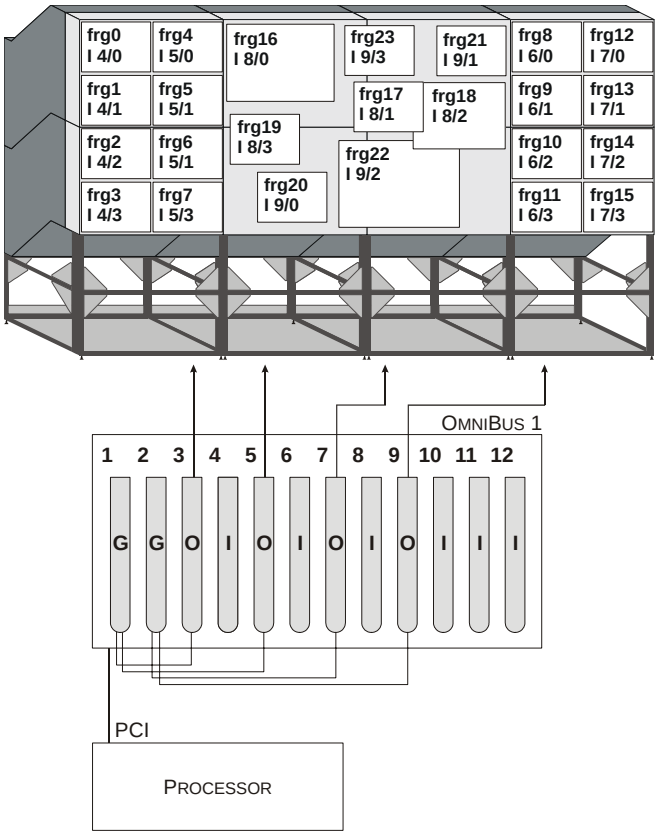


Figure 3-46
small system in OmniBus configuration

Medium system

An example for a configuration for a system with digital output, 24 channels and 20 free movable video windows can be seen in the figure below:

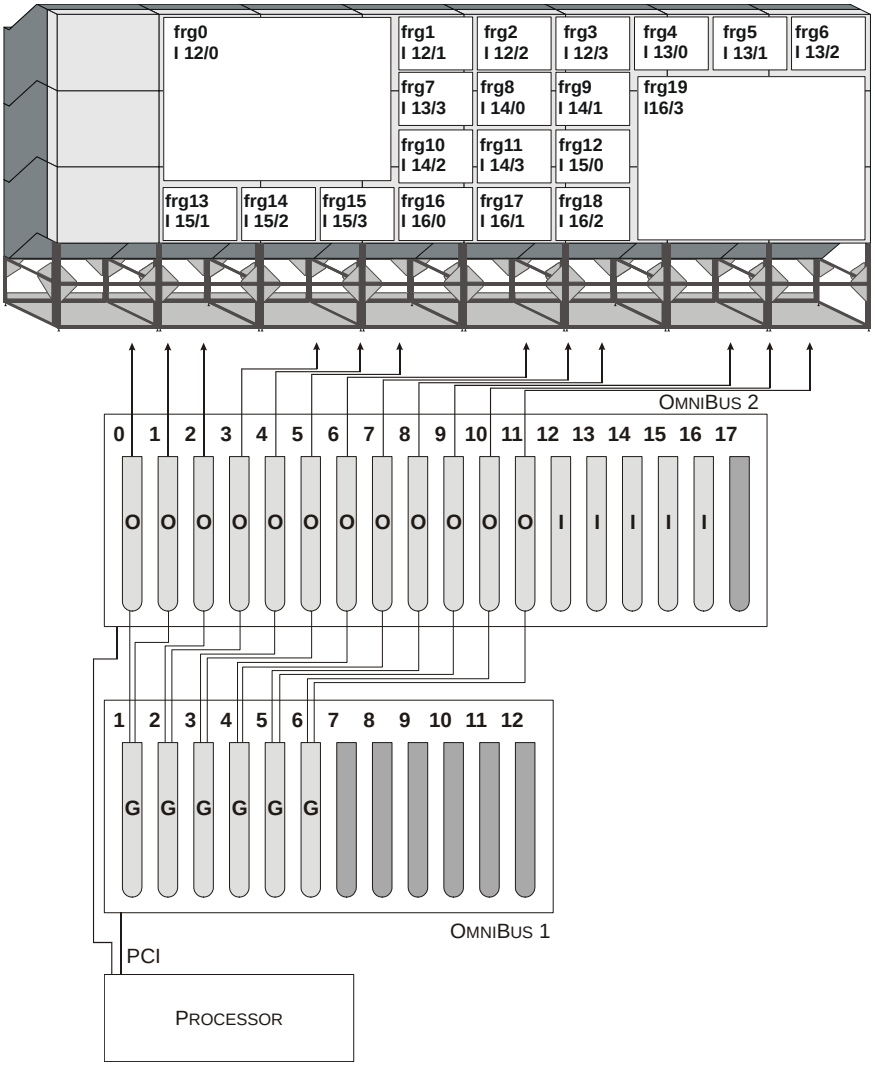


Figure 3-47
medium system configuration

Here it is advantageous to use one OMNIBUS for the graphic cards, the other one for the OMNISCALERS together with the input cards. Because all input cards and OMNISCALERS fit within the same OMNIBUS, all video windows are freely movable on the whole display wall.

Large system

The following system has 54 channels, digital output and 20 video windows that are movable and scalable within their respective display area.

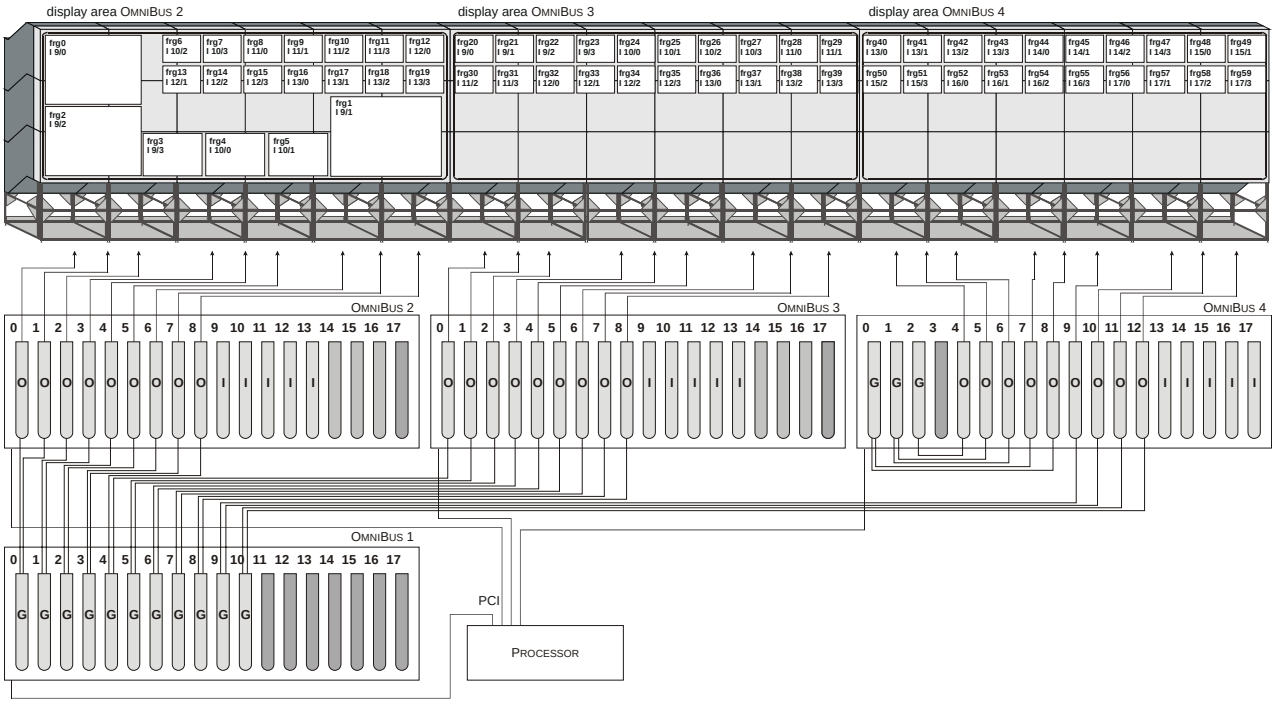


Figure 3-48
large system configuration

Four OMNIBUS devices are used to operate this huge display wall. OMNIBUS 1 is solely filled with graphic cards and does therefore not directly provide data for the wall. OMNIBUS 2, 3 and 4 contain the OMNISCALERS and input cards (and some further graphic cards) and provide the final display data for the projection modules. Hence on the wall there are three logical display areas, each belongs to the OMNIBUS that provides its respective data.

With QUAD ANALOG VIDEO CARDS, QUAD SDI VIDEO CARD and STREAMING VIDEO CARDS 60 videos can be displayed, each 20 restricted to one display area but within these boundaries freely movable and scalable.

It is also possible to configure video in a way that it is freely movable and scalable on the whole display wall. This is called distributed video. It consists of a group of QUAD ANALOG VIDEO CARDS, QUAD SDI VIDEO CARDS or STREAMING VIDEO CARDS, one from each concerned OMNIBUS (2-4). A distributed video can be displayed freely movable and scalable on the whole wall regardless on the different display areas. Also combinations between distributed video and normal video are possible. E.g. one channel of a QUAD ANALOG VIDEO CARD of each OMNIBUS device could be grouped to display one free movable distributed video, whereas the data of the other channels of the QUAD ANALOG VIDEO CARD is shown on their respective display area only.

Please see also the sections 4.2.1 Basic video display mode and 4.2.8 Distributed video.

System with partial usage of OmniScalers

Below is an example of a system with 36 channels. Only a limited number of projection modules need to display video.

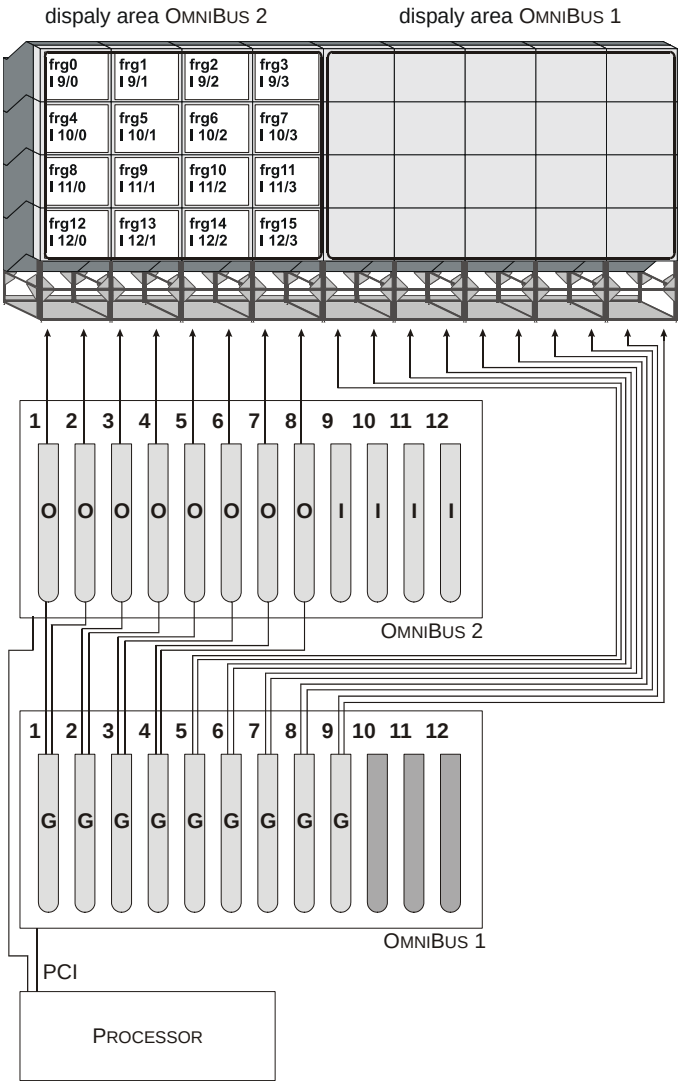


Figure 3-49
system configuration with digital output and partial OMNISCALER usage

Therefore two OMNIBUS devices are used. OMNIBUS 1 is used for graphic cards. The output of the graphic cards 4-8 is directly displayed on the projection modules on the right side of the display wall (display area OMNIBUS 1). The output of the graphic cards 0-3 is provided to the OMNISCALERS in the OMNIBUS 2 for video integration. The output of the OMNISCALERS is displayed on the left part of the display wall (display area OMNIBUS 2). On this area 16 video windows can be displayed and freely scaled and moved. If a video window is moved to the display area OMNIBUS 1, the window appears with the background color.

3.3 Starting up

3.3.1 Connecting

Mouse and keyboard must be connected to the respective connectors on the rear of the PROCESSOR. Please, refer to sections 3.2.2 Mouse and 3.2.3 Keyboard!

- **In an OmniBus configuration** connect the link interface and remote power on/off cables to the TRANSFORM A devices. If an external genlock signal is used, connect it also to the PROCESSOR. Please refer to 3.2.15 OmniBus and 3.2.14 CPU board!
- **In a Processor configuration**, if necessary, connect the EXTENDERS to the PROCESSOR. Please, refer to 3.2.16 Extender!

Plug in the power cables on the back panel of the TRANSFORM A devices. Please, refer to section 3.2.1 Power supply!

Connect the graphic cards to the OMNISCALERS, if OMNISCALERS are used. Connect the display devices to the graphic cards or OMNISCALERS. At least one display must be connected for administrating TRANSFORM A. Please, refer to 3.2.5 Graphic cards and 3.2.6 OmniScaler! Connect the video and RGB sources to the input cards of TRANSFORM A. Please, refer to section 3.2.7 Quad Analog Video Card, 3.2.8 Streaming Video Card, 3.2.9 Quad SDI Video Card, 3.2.10 Dual DVI Input Card and 3.2.11 Dual RGB Input Card!

Connect the PROCESSOR to the local area network by connecting the network to the network card or the network onboard adapter! Please, refer to section 3.2.13 Network!

3.3.2 Switching on

- **In an OmniBus configuration:**
  Using OMNIBUS A18 first make sure that the power switches [26] (Figure 3-11) of all connected OMNIBUS A18 devices are on. The **LED operating status** [3] (Figure 3-10) on each OMNIBUS A18 should show a red light. Check also that the power switches [35] (Figure 3-5) on the rear of the PROCESSOR (if available) are switched on.
  Using OMNIBUS A12 just make sure that the **red LED standby / component failed** [6] (Figure 3-7) is permanently on, indicating Standby mode.
  Then switch on the PROCESSOR by pressing the **power button** [13] (Figure 3-1) on its front! By means of the remote power on/off mechanism all TRANSFORM A devices are now centrally switched on and initialized in the necessary order. The LED operating status of the OMNIBUS A18 should show a green light and the LED power on [4] on the OmniBus A12 should be lighting.
- **In a Processor configuration**, switch on the PROCESSOR by pressing the **power button** [13] (Figure 3-1) on the front! If also an EXTENDER is used switch it on first by pressing the On/Off-switch [3] (Figure 3-13).

Initial system start after delivery

After the pre-configuration of a TRANSFORM A system at the factory the operating system is sealed. Therefore when switching on TRANSFORM A at your site for the first time, the **Windows 2000 or XP Professional Setup** starts and prompts you to enter information to adjust the TRANSFORM A to your site. First read the license agreement before you accept it. Then the **Setup** will prompt you to adjust the regional and language options and to personalize your software. After that enter the product key.

The Microsoft Windows product key is labeled on the inside of the front flap of the Processor.

When asked for the administrator password, enter **barco** and reenter it once again. Finally adjust the date and time settings as well as the network settings. After entering the workgroup or computer domain, the system reboots automatically and is from then on ready for normal operation.

Normal system start

The Windows operating system starts automatically. Please, refer to section 3.4 Operating system!

The system is pre-configured at the factory with an administrator account and a password.

User name	**administrator**
Password	**barco**

Table 3-5

3.3.3 Switching off

Always shut down the Windows operating system, before switching off your TransForm A.

Click the **Start** button on the taskbar and choose **Shut Down ...** to display the **Shut down Windows** dialog box:

Figure 3-50
shut down dialog for Windows 2000/XP

Select **Shut down** and click **OK**. After some seconds a message appears that you can switch off your computer safely. Simply press the **power button** on the front of PROCESSOR.

If TransForm A is switched off as explained above, not all parts are disconnected from the power supply. To disconnect the whole device the power switches of all OmniBus devices, Extender and Processor must be switched off and all power plugs of the devices have to be pulled out after switching off.

3.4 Operating system

TRANSFORM A – Workstation for Windows is suitable to be operated with the operating systems **Windows 2000** or with **Windows XP**. Current deliveries are setup with Windows XP, but the TRANSFORM A software is compatible with and tested for Window 2000 as well and it can be used to update existing Windows 2000 systems to the latest display driver. TRANSFORM A comes with pre-installed operating system.

The Processor AGS-3390-1/-2 is intended only for the usage with Windows XP!

3.4.1 System requirements

The system requirements given by Microsoft for the respective operating system apply also for TRANSFORM A. In addition Barco recommends the usage of the following service packs:

Operating system	Requirements
Windows2000 Professional	Service Pack 4 recommended
Windows XP Professional	Service Pack 2 recommended

Table 3-6
system requirements

The service packs and additionally the Microsoft recommended hot fixes are already installed with every delivered TRANSFORM A system.

3.4.2 Obsolete operating systems

The operating system Windows NT is no longer supported. The display driver 3.5 and newer will no longer be able to run under Windows NT!

If you have a TRANSFORM A system with Windows NT and you want to upgrade the display driver please contact the Barco support, see section 8.3 Contact!

3.5 Configuring

3.5.1 Installing the display driver and switcher language compiler

Initial steps for the installation

Please note: If using for the installation a USB mouse connected to a USB connector (no usage of the PS/2 adapter), the mouse must be operable before logging in to the system. Therefore check, whether the mouse pointer can be moved on the login screen. If it cannot be moved, wait for about 30 seconds and try again. If you log in before the mouse is operable the mouse support will be temporarily disabled during the installation of the display drivers!

After switching on TransForm A, log in as **administrator**. The operating system detects new graphic cards, OmniScalers and OmniBus devices. Therefore the **Found New Hardware Wizard** comes up to install the suitable drivers. But first check the availability of the appropriate installation files. On the hard disk of the Processor the files of the latest release of the display driver suite are stored:

```
c:\BARCO\TransForm A Suite\Windows Driver Suite (OVS-2686)\
  ↳ Windows Driver Suite X.X
```

Whenever the installation of a different release is required, e.g. if the latest release of the Wall Management Software Apollo requires an earlier release of the display driver suite, the respective folder `Windows Driver Suite X.Y` should be copied from CD **TransForm A Suite CRS-3045-C** to the folder

```
c:\BARCO\TransForm A Suite\Windows Driver Suite (OVS-2686)
```

The Found New Hardware Wizard

The Found New Hardware Wizard comes up several times to install newly detected Barco components. The detected hardware differs for a Processor or an OmniBus configuration. In an OmniBus configuration the driver for the OmniBus comprises the control for the Barco expansion cards. In a Processor configuration these drivers have to be installed for each device. The table below shows depending on the configuration how often the Found New Hardware Wizard appears and how it names the detected devices:

Processor configuration	OmniBus configuration
• Each graphic channel detected as: **Video Controller (VGA compatible)** or **AGX-3000** or **AGX-3281** • Each OmniScaler detected as: **Multimedia Video Controller** or **AGX-3002** or **AGX-3313**	• Each OmniBus detected as: **Video Controller (VGA compatible)** or **BARCO PCX-3003/3322/3360 (AGX-3000)** or **BARCO PCX-3003/3322/3360 (AGX-3281)**

The instructions on the next pages show exemplarily the installation for one OmniBus under Windows 2000 or Windows XP. Texts in the dialogs might differ according to the table above for different configurations.

With a Processor configuration take special care for the name used of the wizard. Depending on this name the correct driver file has to be selected.

Windows 2000

On the **Found New Hardware Wizard** click **Next >** to continue.

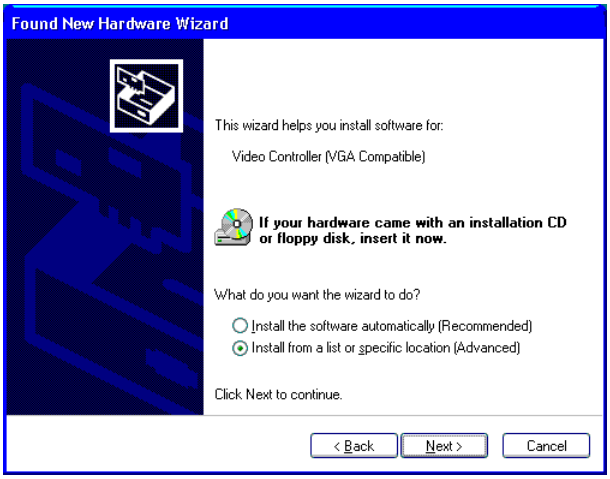
On the **Install Hardware Device Drivers** dialog select **Search for a suitable driver for my device** and continue with **Next**.

Windows XP

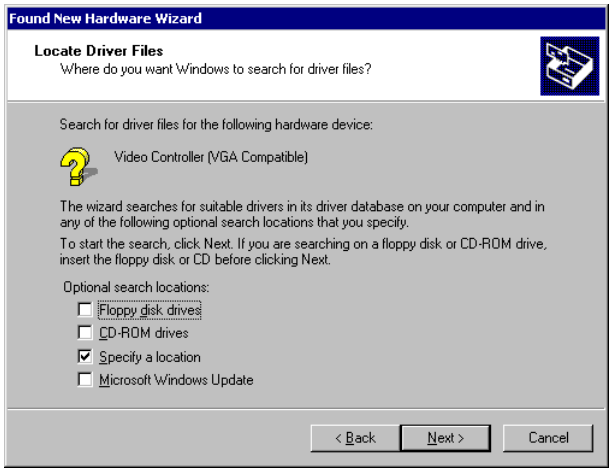
The **Found New Hardware Wizard** asks first for permission to use also the Windows Update Web site for to search for a suitable driver. Click **No, not this time** to prevent this and then **Next >**.

On the **Found New Hardware Wizard** for Video controller (VGA Compatible) select **Install from a list or specific location** and click **Next >** to continue.

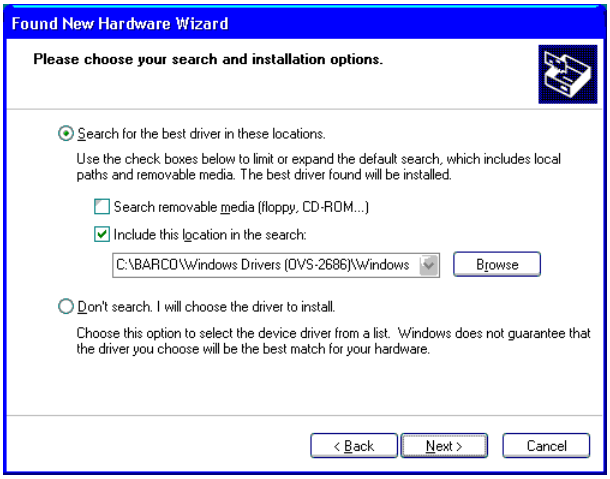
(When the Found New Hadrward Wizard starts again for the next Barco component, it will already show the name of this component correctly in this dialog, anyhow you have to run through the wizard.



On the **Locate Driver Files** dialog, select **Specify a location** and continue with **Next >**.



On the next dialog **Search and installation options** select the upper choice **Search for the best driver in these locations** and **Include this location in the search**. Click on the **Browse** button to select the respective path.



Specify the following path if your system is equipped with UGX GRAPHIC CARDS:

```
c:\BARCO\TransForm A Suite\Windows Driver Suite (OVS-2686)\
  ↳ Windows Driver Suite X.X\AGX3281\agx3281.inf
```

And specify respectively the following path, if your system is equipped with AGX GRAPHIC CARDS:

```
c:\BARCO\TransForm A Suite\Windows Driver Suite (OVS-2686)\
  ↳ Windows Driver Suite X.X\AGX3000\agx3000.inf
```

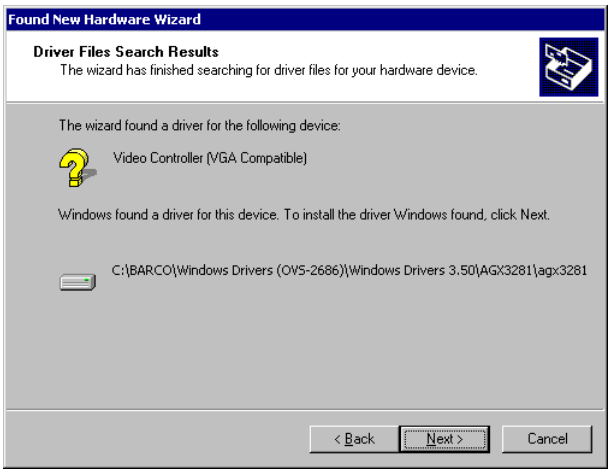
Also the folder `Windows Drivers X.X\INF\` **contains a file** `agx3281.inf` **and** `agx3000.inf`**. These files may NOT be selected for graphic cards or OmniBus devices!**

In a Processor configuration, if the Wizard wants to install the driver for an OMNISCALER, specify the following path:

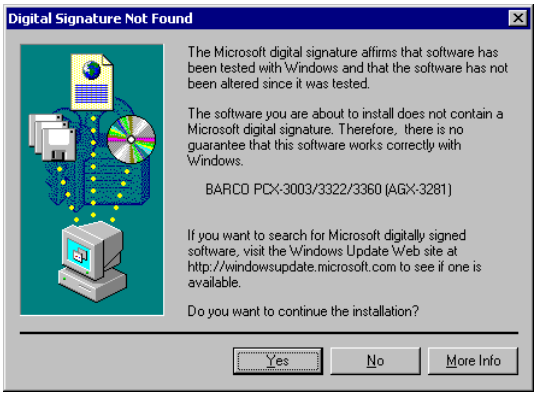
```
c:\BARCO\TransForm A Suite\Windows Driver Suite (OVS-2686)\
  ↳ Windows Driver Suite X.X\INF\agx3000.inf
```

After selecting the appropriate folder click **OK**.

The **Driver Files Search Results** dialog shows the path of the specified driver. Check if the path you entered one step before is indicated and continue with **Next >**.

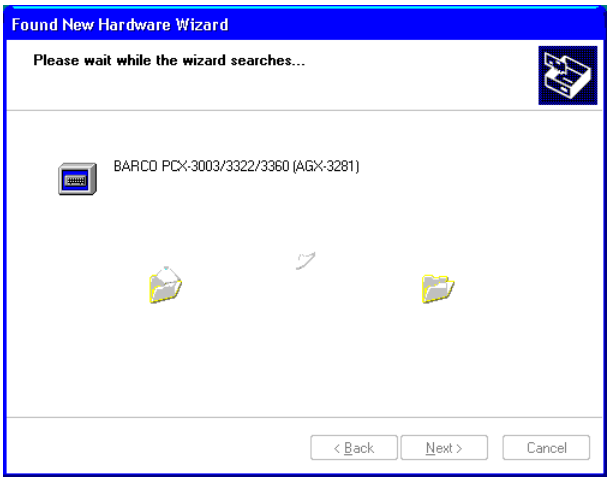


Windows 2000 will inform you that there is no digital signature for this software. Ignore this message and click **Yes**.

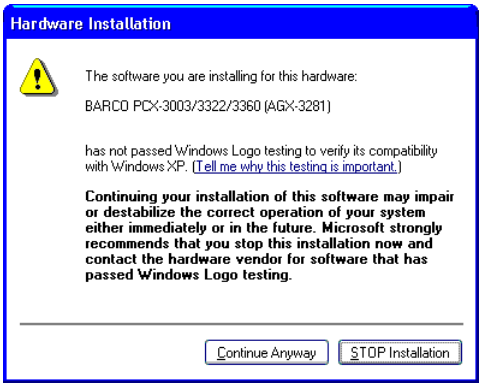


After selecting the appropriate folder click **Next >**.

It takes some seconds during which the wizard searches for the components.

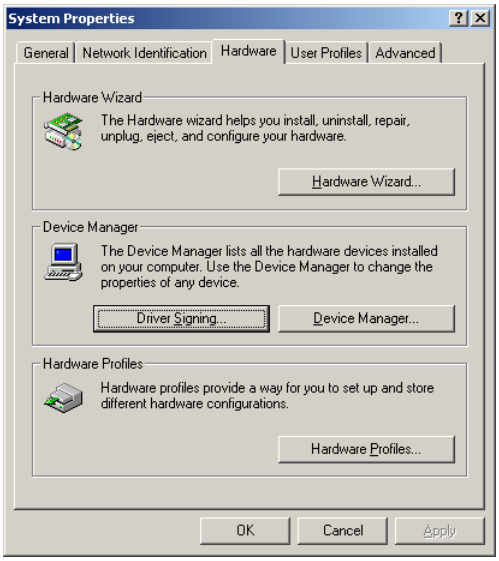


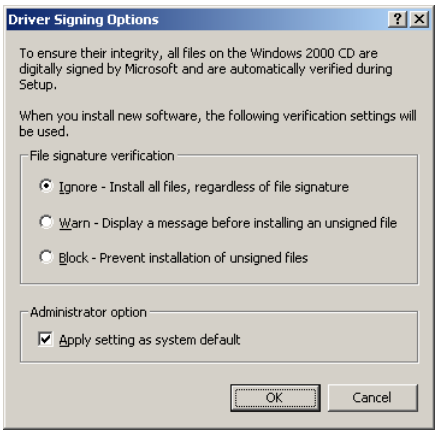
Windows XP will inform you, that the software has not passed the Windows Logo testing. Ignore this message and click **Continue Anyway**.



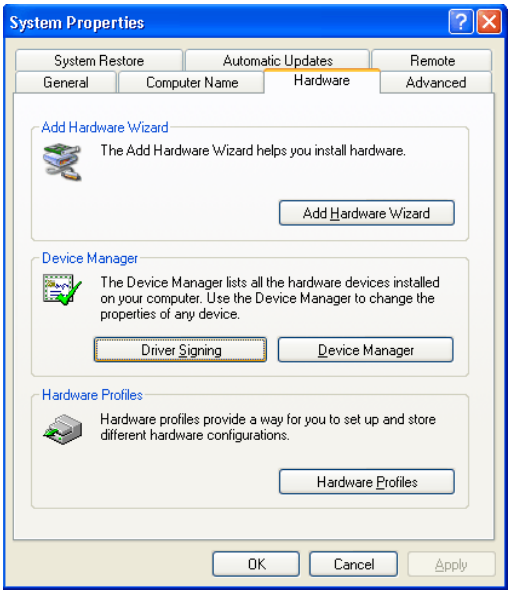
As this question will be asked again for each graphic channel it might be more comfortable to disable this message in beforehand. If you want to do so go to the **Hardware** tab of the **System Properties** dialog (**Start -> Settings -> Control Panel -> System**) and click the **Driver Signing** button. On the **Driver Signing Options** dialog select the option:

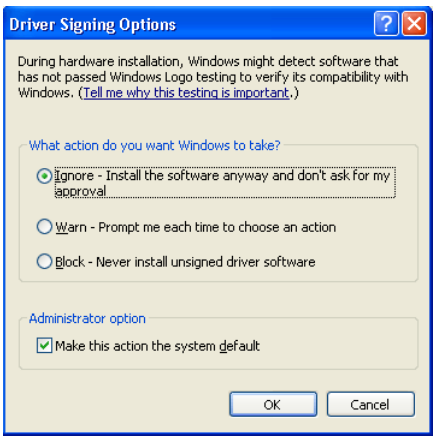
Ignore – Install all files, regardless of file signature



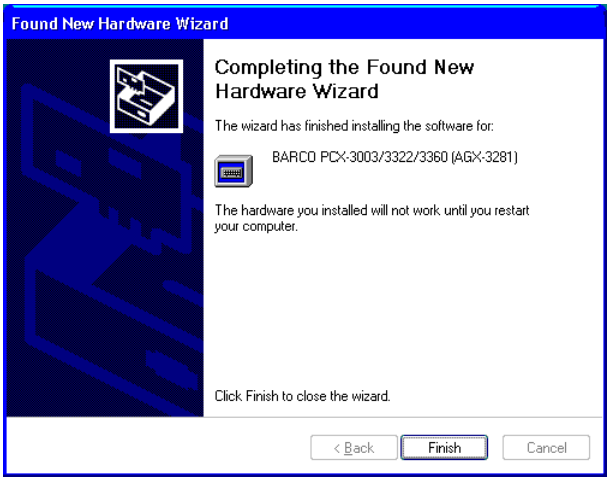


Ignore – Install the software anyway and don't ask me for approval



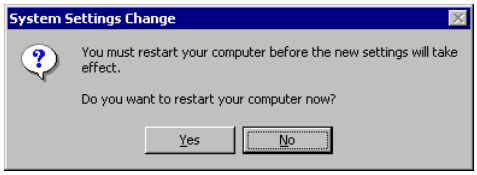


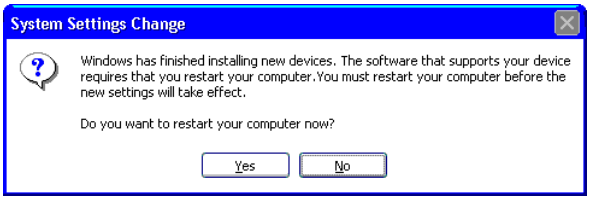
Now the graphics driver gets installed. When the installation is ready, the final dialog of the **Found New Hardware Wizzard** appears.



Just click **Finish** to finalize the operation.

The next dialog prompts you to restart the computer. Click **No** and wait some time to see if the **Found New Hardware Wizard** starts again.





As long as a new **Found New Hardware Wizard** comes up, repeat the steps of this section again for it.

If the **Found New Hardware Wizard** does not start any longer continue with the setup program, see next pages.

Every time the Wizard has finished one installation, you will be prompted to reboot. Nevertheless it is not necessary to reboot, so this should be ignored.

Executing setup.exe

Due to the information assigned in the steps before the standard Windows graphic driver is no longer assigned to the Barco graphic cards. Instead TransForm A operates temporarily in a default 16 colors mode.

After the restart log in as Administrator, open the Windows Explorer and go to the folder:

```
c:\BARCO\TransForm A Suite\Windows Driver Suite (OVS-2686)\
  ↳ Windows Driver Suite X.X
```

Double click on the file `setup.exe`. The script **setup.exe** for the installation of the display driver suite and the switcher language compiler gets started.

The setup wizard will guide you through the installation. Click **Next** to begin the installation:

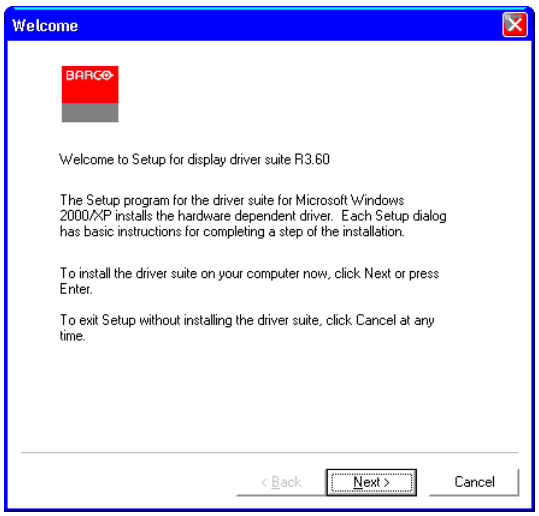


Figure 3-51
welcome window

The next Window shows notes and actual remarks to the release of the display driver and switcher language compiler. Press **Next** to continue:

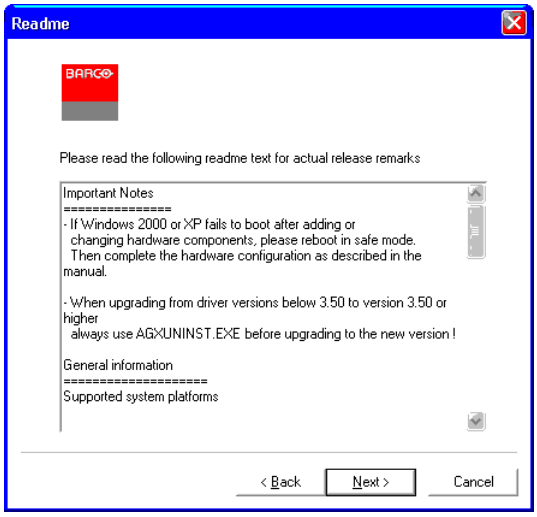


Figure 3-52
readme

Depending on your demands you can select the features that shall be installed, either the display driver or the switcher language compiler or both. Selecting **Display driver** installs the drivers for Barco's graphic cards and input cards. Selecting **Switcher language compiler** installs the switcher language compiler, which allows to flexibly define system configurations with external matrix switchers and input cards in complex and simple applications, please refer to section 4.3.2 Naming of video channels and video sources.

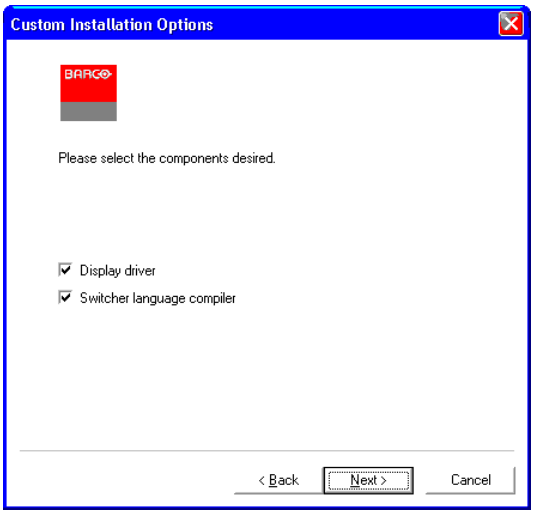


Figure 3-53
custom installation options

If you have selected the switcher language compiler the location for the switcher language compiler has to be confirmed:

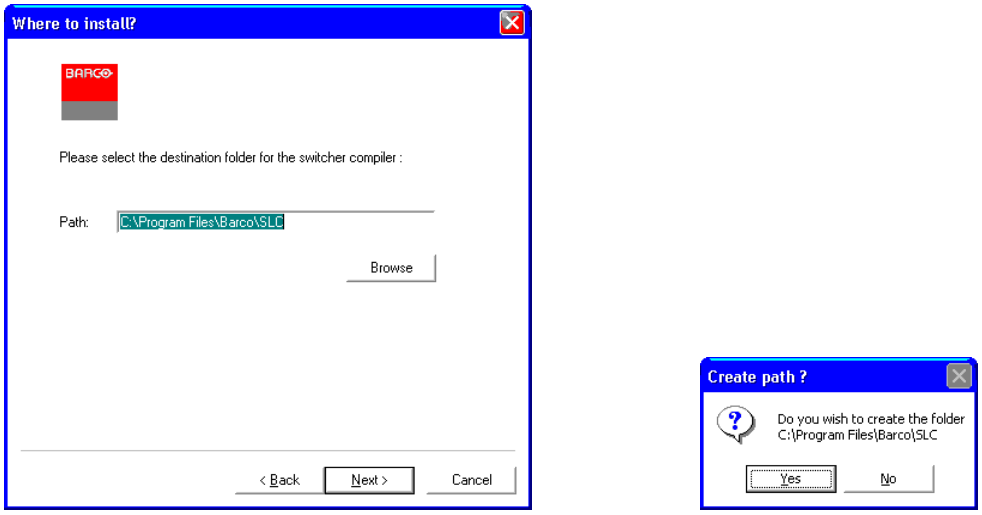


Figure 3-54
destination of switcher language compiler

Next short information about the update behavior for RGB presets is displayed. When updating the display driver the provided preset file might contain additional presets in respect to the former one. This new preset file is copied to the system but it is not automatically activated in order to prevent your customized presets from being removed. To make use of the additional presets please use the Import/Export Presets dialog; refer to section 4.3.10 Configuration of analog RGB and YUV input (Managing preset files).

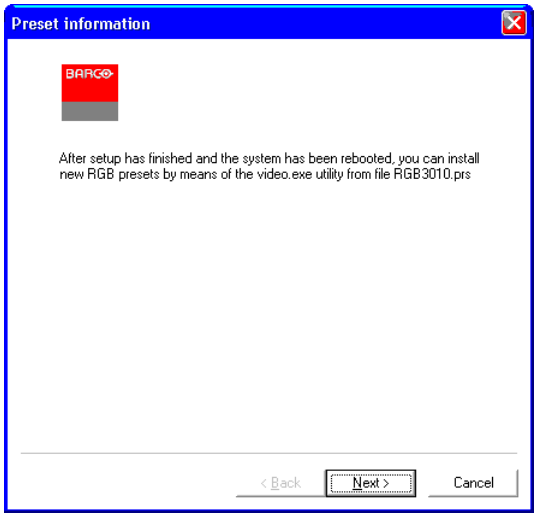


Figure 3-55
preset information

Now all needed information is indicated. If you click **Next**, the installation will begin:

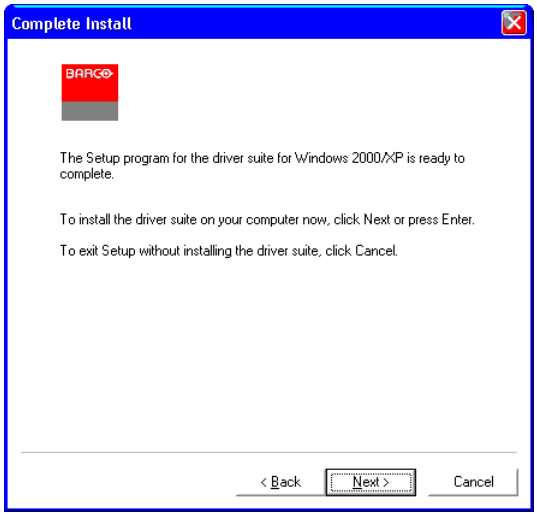


Figure 3-56
start of installation

Windows will point you to the fact that the driver is not digitally signed. Press **Continue Anyway**.

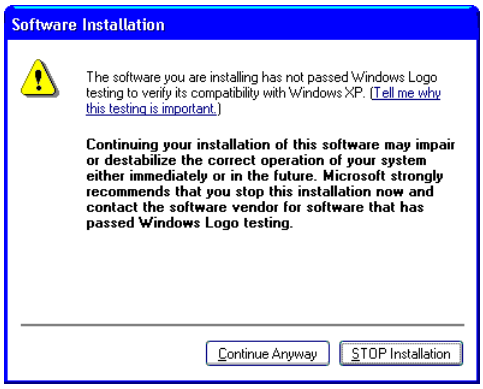


Figure 3-57
Windows logo testing (only with Windows XP)

The files will be copied to your system. This may last a few minutes:

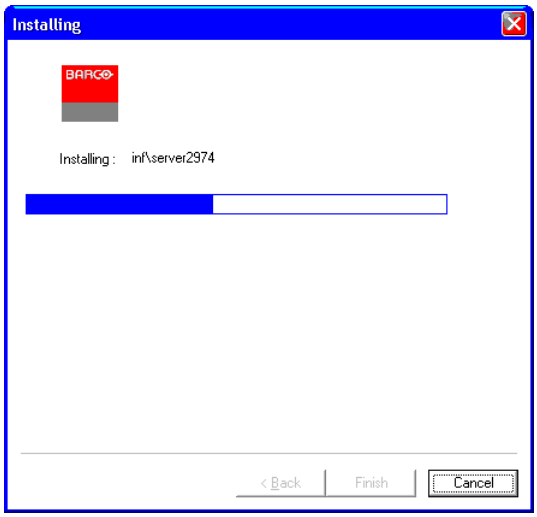
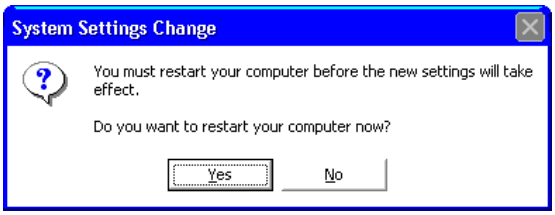


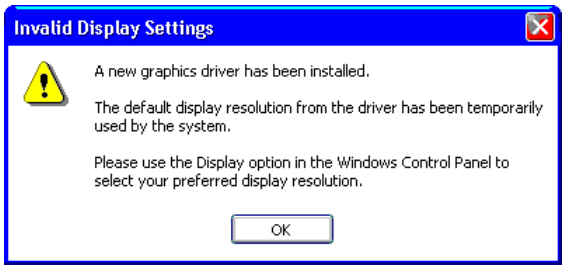
Figure 3-58
copying files

The system will prompt you to restart the computer. For further configuration you have to reboot now. Therefore click **Yes**.

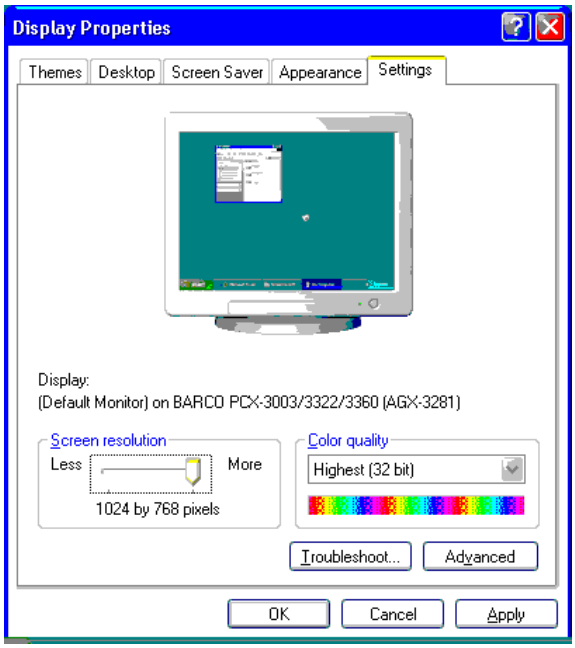


Finishing the installation

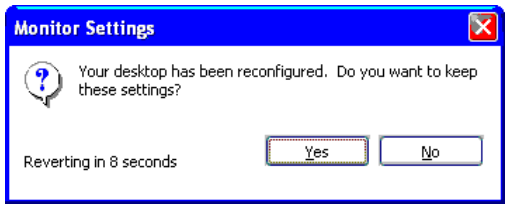
When the system has come up a dialog warns about invalid display settings. Confirm it with **OK**.



The **Display Properties** dialog appears. Move the slider in the section **Screen area** to the very right to select the largest screen area possible and click **Apply**:



The following dialog must be confirmed with **Yes**.



Configuration

After the driver installation you can specify the arrangement and the order of the connected Barco projection cubes, projectors or monitors. Refer to section 3.5.2 Configuring the display driver, please! As well you can configure the video switcher. Refer to section 6.1.3 Configuring video, please!

3.5.2 Configuring the display driver

For configuring the display driver click the **Start** button on the taskbar and choose **Settings** and then **Control Panel** to display the **Control Panel** dialog box:

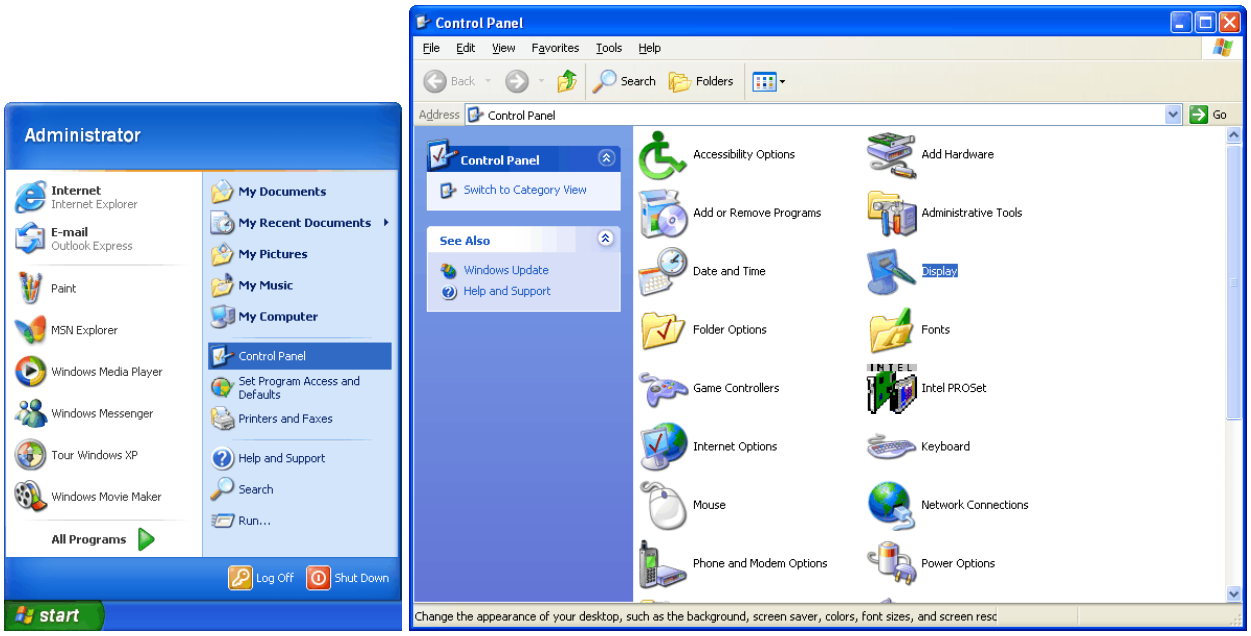


Figure 3-59
Display Settings in the Control Panel

The **Control Panel** dialog box is displayed. Double-click **Display** for displaying the **Display Properties** dialog box and click the **Settings** tab:

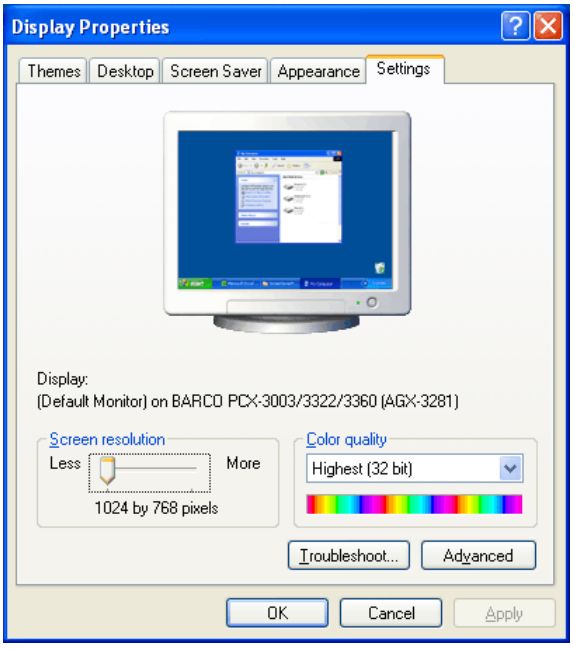


Figure 3-60
Display Properties – Settings

On the **Setting** tab, click **Advanced...** to open the dialog box for the Barco graphic cards properties. Click the **Driver Options** tab:

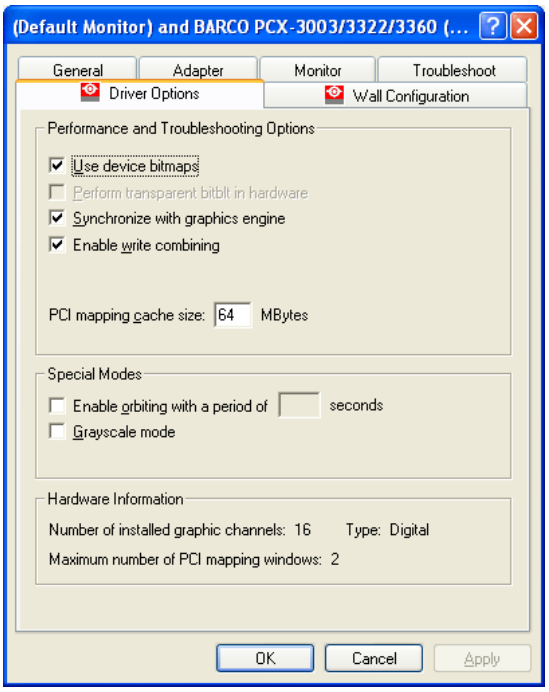


Figure 3-61
Display Properties – Driver Options

UseDeviceBitmaps

With this option selected device bitmaps (off-screen video memory) are used.

Default	selected
Effective	after rebooting

Table 3-7

Applications can store bitmaps, which are not longer displayed but should be recalled quickly in the video memory (off-screen video memory). If you experience errors as display corruption or crashes and suspect that they could be related to the usage of device bitmaps or to the display driver in general, turn this option off.

The simplest possibility to bypass all conflicts in storage management is to deactivate the use of device bitmaps. However, this will cause a decrease of graphic performance in most cases.

In general the following simple rule brings good results: For all resolutions smaller than 1600×1200, 32 bpp use device bitmaps else do not use device bitmaps.

Please, refer to 6.1.2 Registry reference for further details about memory management (**UseDeviceBitmaps**).

Perform transparent bitblt in hardware

This option has no effect on the display properties of TRANSFORM A.

Synchronize with graphics engine

With this option not selected the graphic performance can be increased accepting a longer interrupt time.

Default	selected
Effective	after rebooting

Table 3-8

Extensive graphic operations may cause modem data-loss (lost bytes). In this case, the **Synchronize with graphic engines** option can be selected.

Enable write combining

With this option selected write combining is enabled on CPUs with Pentium Pro, Pentium II, Pentium III, Pentium IV or Celeron processor.

Default	selected
Effective	after rebooting

Table 3-9

Write combining enables the CPU to transfer images to the graphical boards faster but may cause rendering errors if used with incompatible hardware.

PCI mapping cache size

The amount of memory available for PCI mapping cache can be entered in the **PCI mapping cache size** text box. The value is specified in Megabytes.

Value	`4 ... 64`
Default	64
Effective	after rebooting

Table 3-10

The PCI mapping cache address space is actually consumed in multiples of 16 MB. The specified value is rounded to the next larger 4 MB or 16 MB multiple.

Enable orbiting

With this option selected the orbiting of the display is started and the orbiting time can be defined.

Default	not selected
Effective	initially after rebooting, changed value after one step

Table 3-11

When connecting display devices susceptible to image burn-in like CRT monitors to TRANSFORM A, the orbiting mode can help to reduce this effect. With orbiting a reduced Windows desktop is moved permanently around on the connected CRT devices with the steps specified in seconds.

With Orbiting enabled the standard resolutions are reduced by 16 pixels on horizontal and vertical direction. A desktop of 1280×960 pixels is thus reduced to 1264×944 pixels. The least permissible resolution is 800×600 (784×584) pixels because a reduced VGA display would fall below the minimum Windows desktop size of 640×480.

Orbiting may not be used, if on the Wall Configuration tab either Overlap or 1x2 settings is activated!

When orbiting is enabled the option /m must be used for video applications, please refer to section 4.3.1 Display in a window**.**

Grayscale mode

With this option selected the display driver offers a single 8 bpp format with a fixed palette containing up to 256 shades of gray (linear or gamma corrected).

Default	not selected
Effective	initially after rebooting

Table 3-12

Hardware information

Under **Hardware Information** some information about the hardware configuration is displayed.

3.5.3 Configuring the display wall

For configuring the display wall open the dialog box for the Barco graphic cards properties as described in section 3.5.2 Configuring the display driver. Click the **Wall Configuration** tab.

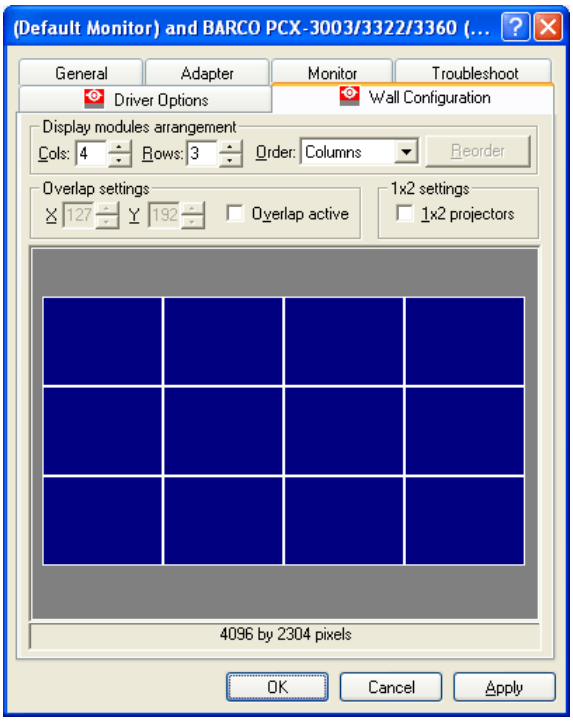


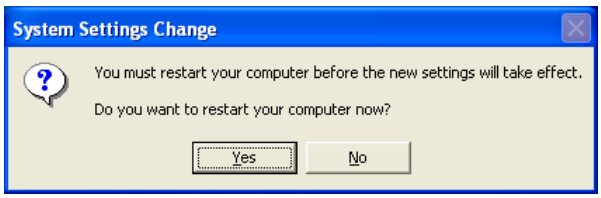
Figure 3-62
Display Properties – Wall Configuration

Display modules arrangement

In the **Display modules arrangement** section configure your display wall by entering the number of columns into the **Columns** box and the number of rows into the **Rows** box. The configuration is interactively displayed below.

Either indicate the Cols and Rows number by clicking the arrows beneath the number or if entering the values with the keyboard, press the Enter key to submit the values.

Press Apply, when you have entered the rows and columns. The system prompts you again to reboot. Confirm the dialog with **Yes**.



After reboot open again the **Display Properties** dialog and check that an appropriate color depth (**Highest (32 bit)**) and resolution (the overall resolution of the whole display wall) is selected. Therewith the system is ready for further configuration, e.g for assignment of the graphic channels.

The assignment made through this dialog must correspond to the physical cabling between the graphic cards or OmniScalers and the projection modules to produce a consistent picture of the complete desktop.

As default the Barco projection cubes and graphic channels are assigned in columns from top to bottom starting with the left column (view from in front of the screens). For the numbering of graphic cards see section 3.2.5 Graphic cards and section 3.2.15 OmniBus, please.

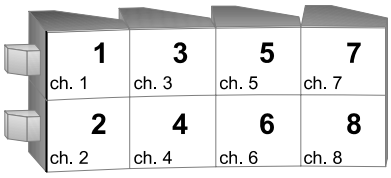


Figure 3-63
Default order of projection cubes

This assignment may be changed for some reason. E. g., it may be advantageous to change the order thus, that the channels are assigned in rows instead of columns. For this assignment of projection cubes to graphic channels, see as well the example in the figure below, you can select **Rows** in the **Order** box.

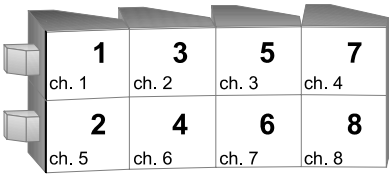


Figure 3-64
Alternate assignment of graphic channels

For a freely defined order select **User defined** instead. Then you can assign interactively each projection cube to its corresponding graphic channel. This is especially helpful, if graphic cards are plugged into multiple OmniBus devices.

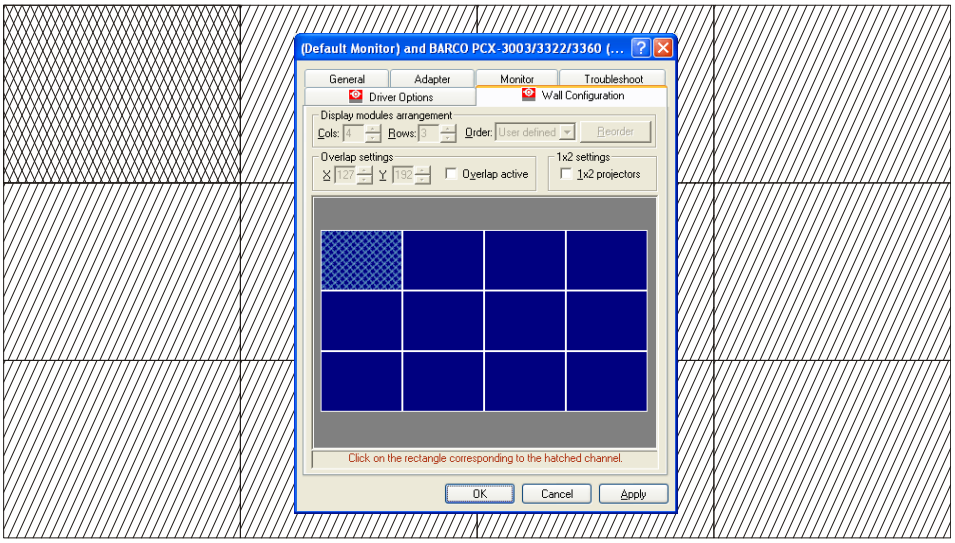


Figure 3-65
Screen order

After pressing the **Reorder** button, one graphic channel after the other is highlighted on the display wall. In the picture of the display wall in the **Display Properties** dialog box do a left click on the corresponding graphic channel at the same position. After assigning all graphic channels a dialog box appears. Confirming the question 'Apply changes now?' with **Yes** causes the wall to be reordered immediately.

Especially for distributed video, see section 4.2.8 Distributed video, a reassignment as explained above can be necessary to meet the specific needs with respect to PCI segmentation and projection cube assignment.

1×2 settings

TRANSFORM A allows controlling of two display devices from one TRANSFORM A output. Thus one UGX GRAPHIC CARD is able to control eight projection modules altogether. This is called **1×2 XGA settings**.

One graphics signal of TRANSFORM A contains the display information for two projection modules with XGA resolution (1024×768 pixels), which results in a timing with 1024×1536 pixels. The graphics card connects just to one of the projection modules; this module displays only its part and loops through the unchanged signal to the second projection module, which displays the other part of the signal.

System requirements

The following conditions have to be met to allow 1×2 XGA settings:

- The resolution of a projection module must be XGA (1024×786 pixels).
- The projection modules must support 1×2 XGA settings with an input signal of 1024×1536 pixels and loop through functionality.
- Only projection modules which are positioned on top of each other can form a couple and use one graphics channel commonly.
- The graphics cards in TRANSFORM A have to be UGX GRAPHIC CARDS
- In general the upper projection module is connected to the output channel of TRANSFORM A; the lower projection module is connected to the loop-through output of the upper projection module.
- If the display wall has an odd number of rows, then the bottom row does not use 2×1 settings and each projection module of the bottom row has to be connected directly to an output of TRANSFORM A.

Setup and configuration

For 1×2 XGA settings the cabling between TRANSFORM A and projection modules must be considered. One graphics channel of TRANSFORM A is connected to the DVI in connector of the first module, the DVI out connector of this module is connected to the DVI connector of the second module; please refer to the corresponding user documentation for the configuration of the projection module for 1×2 XGA setting. An example for the default cabling is shown in the figure below:

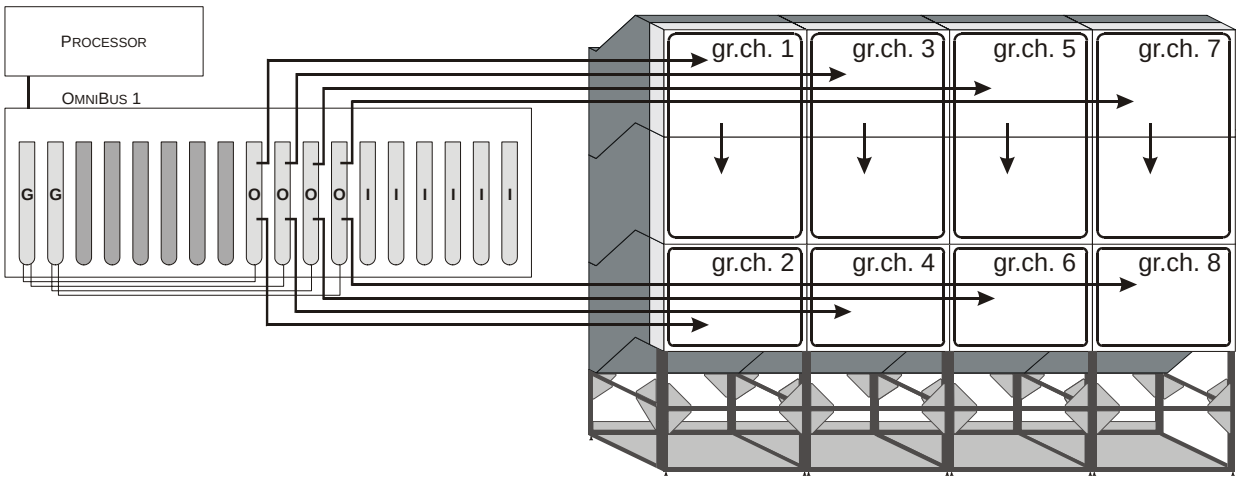


Figure 3-66
cabling and graphics channels for 1×2 XGA settings

On the wall configuration tab the checkbox **1x2 projectors** must be enabled. One graphic channel, i.e. two modules on top of each other is depicted as one 3:4 array with a horizontal bar in the middle. The **Rows** and **Cols** boxes still indicate the number of projection modules.

Overlap settings

Overlapping is of no use for OverView rear projection systems. With an OverView rear projection system connected to the TransForm A the feature should not be enabled, even if the X and Y values are set to 0!

Overlapping is only supported with the UGX Graphic Card!

The overlap settings can be used with projectors for front projection which support the overlapping feature (edge blending). It is used to have smooth transitions between the projections of multiple projectors. An array of pixels at the border between two adjacent projectors is generated twice for each of the two projectors. This enables to overlap the projection area.

To use overlapping the **Overlap active** checkbox must be enabled. The number of double-generated pixels between projectors located next to each other is determined with **X** and between projectors located on top of each other with **Y**.

The visible amount of pixels of the complete projection, the desktop size, is reduced accordingly.

Overlap can only be used with the orders **columns** or **rows**. If **custom** has been selected before it is automatically changed to **columns**.

Overlap can only be switched, if no instance of video.exe is running. Therefore close all video windows before activating overlap.

3.5.4 Setting display properties

Setting of desktop area and refresh frequency is available for graphic cards in analog mode only!

If you have not yet restarted your TRANSFORM A since installing the display driver, you have to restart it before setting the display properties.

For setting the display properties, open the **Display Properties** dialog box as described in section 3.5.2 Configuring the display driver. Click the **Settings** tab. Move the slider in the **Screen area** box to select the appropriate resolution of your display wall.

Click **Advanced...** to open the dialog box for the Barco graphic cards properties. To select the refresh frequency of an analog monitor click the **Monitor** tab. In the **Monitor Settings** box click the desired refresh rate.

Click **OK** to confirm the settings in the **Display Properties** or the dialog box for the Barco graphic cards properties.

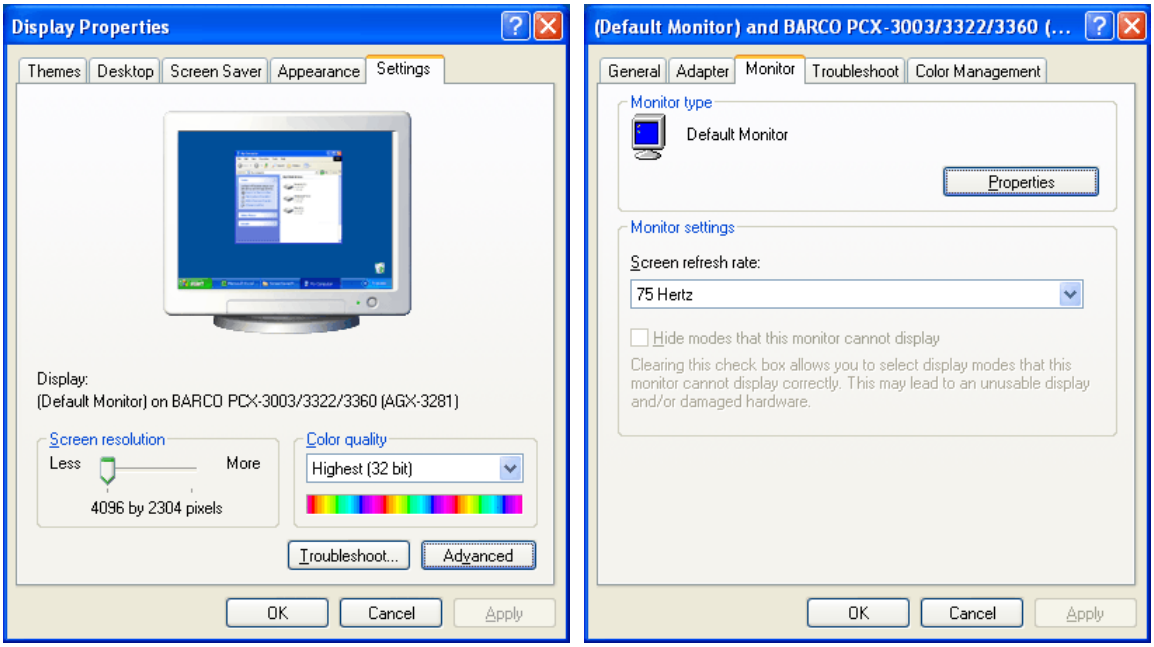


Figure 3-67
Settings tab (left) and Monitor tab (right)

3.6 Optimization

This section provides hints and tips of how to configure TRANSFORM A for optimal operation.

3.6.1 Appropriate cursor for video applications

If displaying video it is important to work with an appropriate cursor. TRANSFORM A uses always a hardware cursor, if not a colored pointer scheme is selected. A hardware cursor has the advantage, that it is permanently visible also on video, whereas a software cursor is only sporadically visible on video windows. When a colored pointer scheme is selected, Windows automatically switches to a software cursor. Therefore use the standard pointer scheme or, if using another pointer scheme, try out if it is correctly displayed over video.

4 Operating

This chapter shows the capabilities that TRANSFORM A offers for displaying video and RGB signals.

4.1 Input cards

For showing information from external sources like video or RGB data on a Barco display wall a set of input cards is provided. For integration of video the QUAD ANALOG VIDEO CARD, the QUAD SDI VIDEO CARD, the STREAMING VIDEO CARD and the DUAL DVI INPUT CARD are available and RGB data can be shown with the DUAL RGB INPUT CARD or the DUAL DVI INPUT CARD. Multiple input cards can be inserted into an OMNIBUS or into the devices of a Processor configuration.

A software application video.exe is provided with TRANSFORM A for controlling all these cards. Even though each type of input card has its own tailored dialog for the different video and RGB signals, in all cases the window to display a signal will be called video window. The video windows can be scaled and moved within the projection cubes connected to that OMNIBUS (OmniBus configuration) or to the whole system (Processor configuration).

In general downscaling of the data is performed by the input card, upscaling is performed by the OMNISCALER unless otherwise mentioned.

4.1.1 Quad Analog Video Card

Four composite video sources can be connected to a QUAD ANALOG VIDEO CARD and displayed simultaneously.

4.1.2 Streaming Video Card SVC-1

The STREAMING VIDEO CARD SVC-1 is able to decode and simultaneously display the following formats and amount of video streams:

MPEG-1	up to 4 streams (all resolutions)
MPEG-2	up to 4 D1 streams or 4 CIF streams
MPEG-4 part 2	up to 4 CIF streams or 3 2CIF streams or 1-2 4CIF streams (if content is highly dynamic e.g. action movies, it is recommended to decode 1 4CIF stream per board)
MPEG-4 h263	up to 4 CIF streams or 4 2CIF streams or 4 4CIF streams
MJPEG	up to 4 CIF streams or 2-4 4CIF streams (AXIS: 4 CIF streams 75% quality/25% compression)
MxPEG	up to 4 CIF streams or 2 1280x576 streams
Visiowave	1-3 D1 streams or up to 4 CIF streams (depends on resolution)
TRANSFORM SCN	1 stream

All streams decoded by one card must have been encoded with the same compression algorithm.

4.1.3 Streaming Video Card SVC-2

The STREAMING VIDEO CARD SVC-2 is able to decode and simultaneously display the following formats and amount of video streams:

MPEG-2	up to 15 Mbps per stream
MPEG-4 part 2	up to 8 Mbps per stream
Visiowave	up to four streams

For each stream the STREAMING VIDEO CARD SVC-2 provides a dedicated DSP. Therefore any combination of the above mentioned compression algorithms can be decoded by one card simultaneously.

4.1.4 Streaming Video Card J2K

The STREAMING VIDEO CARD J2K is able to decode and simultaneously display the following formats and amount of video streams:

JPEG2000	from 1 stream with up to 1000 Mbps till 4 streams with up to 800 Mbps together

4.1.5 Quad SDI Video Card

Four different digital video sources can be connected to a single QUAD SDI VIDEO CARD and displayed simultaneously.

4.1.6 Dual DVI Input Card

The DUAL DVI INPUT CARD processes one or two signals. These can be sources of multiple types: composite video or S-Video, analog or digital RGB sources or component video.

The most common VESA timings and HDTV timings are stored as presets for RGB sources and HDTV signals. In addition, user defined timings can be saved. The timing and aspect ratio of the connected signal is detected automatically.

The card provides two input modes: Dual input mode to display two signals simultaneously and single input mode for specially demanding sources. The mode is automatically switched depending on the signal that is applied at **In 1**. In single input mode the second input is not available.

	dual input mode	**single input mode**
In 1	analog signals up to 170 MHz pixel clock digital signals up to about 288 MHz pixel clock	analog signals up to 340 MHz pixel clock digital signals up to 330 MHz pixel clock
In 2	analog signals up to 170 MHz pixel clock digital signals up to 165 MHz pixel clock	– –

Table 4-1
Input modes of DUAL DVI INPUT CARD

The DUAL DVI INPUT CARD has an automated static frame rate reduction depending on number and type of the signals it processes, please see the table below.

	static frame rate reduction
signals ≤ 1280×720@60/50 Hz	1
signals between 1280×720@60/50 Hz and 1920×1080@60/50 Hz	1/2
signal > 1920×1080@60/50 Hz	1/4

Table 4-2
static frame rate reduction for Dual DVI Input Card

The video software allows selecting additionally a dynamic frame rate reduction of the source, which must be multiplied by the static frame rate reduction to obtain the overall frame rate reduction.

4.1.7 Dual RGB Input Card

The DUAL RGB INPUT CARD digitizes one or two analog monitor signals. It supports two monitor signals with a pixel frequency between 10 MHz and 135 MHz. The most common VESA timings are stored as presets. In addition, user defined timings can be saved. The timing and aspect ratio of the connected RGB signal are detected automatically.

4.1.8 Amount of video and RGB windows

The number of video and RGB data that can be processed in TRANSFORM A underlies the available bandwidth.

- In each OMNIBUS A18 there are 400 MBps available
- In an OMNIBUS A12 the available bandwidth per card is usually at least 200 MBps depending on the overall configuration.
- In a Processor configuration the system (PROCESSOR and EXTENDER together) provides 100 MBps and a single PROCESSOR **AGS-3390-1/-2** provides 200 MBps respectively.

The following table gives an overview about the bandwidth required for some standard window sizes. In the last four columns there are in addition the maximal values for windows of that source type in the four different device types, OMNIBUS A18, input card in OMNIBUS A12, Processor configuration, and Processor AGS-3390-1/-2. These values are valid, if only windows with the specified properties are displayed.

type	number of pixels	frame rate [fps]	color depth [bpp]	bandwidth per window [MBps]	max. amount of windows per			
					OmniBus A18	input card in OmniBus A12	Processor Configuration	Processor AGS-3390 -1/-2
NTSC	640×480	30	16	**19**	**21**	**4 / 2** [2), 3)]	**5**	**10**
PAL/SECAM[1)]	720×540	25	16	**20**	**20**	**4 / 2** [2), 3)]	**5**	**10**
HDTV 720p	1280×720	25	16	**47**	**8**	**2** [2)]	**2**	**4**
HDTV 720p	1280×720	30	16	**56**	**7**	**2** [2)]	**1**	**3**
HDTV 1080i	1920×1080	25	16	**104**	**3**	**2** [2)]	**–**	**1**
HDTV 1080i	1920×1080	30	16	**125**	**3**	**2** [2)]	**–**	**1**
XGA	1024×768	10	16	**16**	**25**	**2**	**6**	**12**
XGA	1024×768	15	16	**24**	**16**	**2**	**4**	**8**
XGA	1024×768	20	16	**32**	**12**	**2**	**3**	**6**
SXGA	1280×1024	10	16	**27**	**15**	**2**	**3**	**7**
SXGA	1280×1024	15	16	**40**	**10**	**2**	**2**	**5**
SXGA	1280×1024	20	16	**53**	**7**	**2**	**1**	**3**
UXGA	1600×1200	10	16	**39**	**10**	**2**	**2**	**5**
UXGA	1600×1200	15	16	**58**	**6**	**2**	**1**	**3**
UXGA	1600×1200	20	16	**77**	**5**	**2**	**1**	**2**
2K	2048×2048	10	16	**84**	**4**	**1**	**1**	**2**
2K	2048×2048	15	16	**126**	**3**	**1**	**–**	**1**
2K	2048×2048	20	16	**168**	**2**	**1**	**–**	**1**
XGA	1024×768	10	24	**24**	**16**	**2**	**4**	**8**
XGA	1024×768	15	24	**36**	**11**	**2**	**2**	**5**
XGA	1024×768	20	24	**48**	**8**	**2** [2)]	**2**	**4**
SXGA	1280×1024	10	24	**40**	**10**	**2**	**2**	**5**
SXGA	1280×1024	15	24	**59**	**6**	**2**	**1**	**3**
SXGA	1280×1024	20	24	**79**	**5**	**2** [2)]	**1**	**2**
UXGA	1600×1200	10	24	**58**	**6**	**2**	**1**	**3**
UXGA	1600×1200	15	24	**87**	**4**	**2**	**1**	**2**
UXGA	1600×1200	20	24	**116**	**3**	**2** [2,)]	**–**	**1**
2K	2048×2048	10	24	**126**	**3**	**1**	**–**	**1**
2K	2048×2048	15	24	**189**	**2**	**1**	**–**	**1**
2K	2048×2048	20	24	**252**	**1**	**1** [2)]	**–**	**–**

Table 4-3
size of video/RGB data and number of displayable video windows in case that only this type of video window is displayed

1) SECAM only with QUAD ANALOG VIDEO CARD, DUAL DVI INPUT CARD and STREAMING VIDEO CARD

2) Overall configuration has to be considered

3) For QUAD ANALOG VIDEO CARD or STREAMING VIDEO CARD and DUAL DVI INPUT CARD respectively

To calculate the bandwidth for windows of different sizes or frame rates the following formula can be used:

$$B = res_x * res_y * fr * cd$$

The abbreviations have the following meaning:

- **res_x, res_y – resolution of the source in x- and y-direction in pixels**
  It is important to consider all scaling factors used to display the window. In general up-scaling is performed in the OMNISCALER therefore data is transferred 1:1 and the original resolution must be inserted into the formula. If the source is displayed smaller than 1:1 the source is down-scaled in the input card. Only this reduced number of pixels is transmitted to the OMNISCALER and must be considered. The original size of the different video types can be read from the table above.
- **fr – frame rate**
  For video a frame rate of 25fps (PAL/SECAM) and 30fps (NTSC) is standard. For dynamic RGB input a frame rate of 20 fps in normal cases gives an acceptable performance. If the RGB-source is mostly static even lower frame rates can be selected.
- **cd – color depth**
  For all video windows with the default Pixel format YUV 4:2:2 the factor is:
  cd = 2
  For RGB windows two different Pixel formats may be useful:
  Pixel format = **RGB 5:6:5** **cd = 2**
  Pixel format = **RGB 8:8:8** **cd = 3**

With the average bandwidth of the OMNIBUS A12 of 200 MBps per input card the sum of the bandwidth demands of the windows provided by one input card should not be bigger than this value. Anyhow also higher bandwidth usage might be possible but the overall configuration should be considered (In case of doubt contact the Barco support; please refer to section 8.3 Contact.) :

$$200\ MBps = B_1 + B_2 + \ldots + B_n$$

With the effective bandwidth of the OMNIBUS A18 of 400 MBps the sum of the bandwidth of the individual windows may not be bigger than 400 MBps to provide optimal performance:

$$400\ MBps = B_1 + B_2 + \ldots + B_n$$

In a Processor configuration with 100 MBps the following correlation must be considered:

$$100\ MBps = B_1 + B_2 + \ldots + B_n$$

With a single Processor **AGS-3390-1/-2** with 200 MBps the following correlation must be considered:

$$200\ MBps = B_1 + B_2 + \ldots + B_n$$

Bandwidth optimization for video and RGB windows:

All optimization settings are made in the video software of TRANSFORM A, please refer to the sections 4.3.4 Displaying sources of Quad Analog Video Card and the following.

Number of pixels

Video and RGB data can be pre-scaled on the input card. The amount of pixels of a frame is recalculated to a lower amount. This reduced amount of pixels means lower need of bandwidth for the transmission to the OMNISCALERS. On the OMNISCALER the factor for pre-scaling is considered during up-scaling to obtain a video window in the desired size. (Use **Pre-Scale** in the **Scaler Settings** dialog). In the bandwidth formula only the reduced amount of pixels must be considered.

Frame rate

For video sources there are two settings for the **Frame Rate** selectable.
For RGB sources the frame rate depends on the setting of the **Frame Rate Reduction**. Sources of the DUAL DVI INPUT CARD consider in addition the static reduction of the frame rate, which depends on the input mode; please refer to section 4.1.6 Dual DVI Input Card.

Color depth

RGB sources can be digitized with 16 bpp or with 24 bpp (Use **Pixel Format** in the **Scaler Settings** dialog); please refer to section 4.3.3 Video software.

4.2 Features of video and RGB display

4.2.1 Basic video display mode

Normally the videos and RGB data are displayed in windows. These windows may be moved and resized on their respective display area and can overlap like other application windows.

4.2.2 Channel video

Video and RGB signals respectively can also be displayed without borders and fitted to complete projection cubes (1 to n×n, depending on configuration). This is called channel video.

4.2.3 OmniScaler

The OMNISCALER is used together with graphic cards in digital mode. After the graphic card generated the graphic data stream, it is transferred to the OMNISCALER, where the video and RGB data is integrated to it. Each input source can be individually scaled up to full-screen and higher and color depth can be selected independently from the color depth chosen for the Windows 2000 or Windows XP desktop. One OMNISCALER provides the capability to process up to 128 video and RGB inputs simultaneously.

Video and RGB data is triple buffered. Therefore only entire frames are displayed in sync with the graphical data to avoid frame tearing.

4.2.4 Video switcher

By means of an optional video switcher multiple analog sources can be connected to one port of an input card. In the dialog box of the video software the sources can be switched during operation.

For the operation of distributed video also a video switcher may be used. The configuration of the video switcher is described in section 6.1.3 Configuring video.

4.2.5 Genlock

TRANSFORM A in an OmniBus configuration provides the ability for genlocking. Either a video of a QUAD ANALOG VIDEO CARD, a DUAL DVI INPUT CARD, of a STREAMING VIDEO CARD or the clock of an AGX GRAPHIC CARD, UGX GRAPHIC CARD or an external studio signal can be used as reference signal. For the functionality of genlock, please refer to section 6.1.12 Genlock.

4.2.6 Cascaded OmniScaler

To increase the amount of video sources that can be displayed on a given number of projection modules and that can be displayed freely movable, the cascaded OMNISCALER configuration can be used. Multiple OMNIBUS devices are put in a chain each adding video content to the graphics data and providing the graphical signal with the video windows to the next OMNIBUS until all video windows are provided in the signal and it can be displayed on the display wall. Please refer also to section 6.2.1 Cascaded OmniScalers.

4.2.7 Plain video mode

The plain video mode may be used in a system where only very view videos are displayed. In such systems it is possible to omit the OMNISCALERS. Video in plain video mode can not be upscaled and the color depth of the whole display is limited to a color depth of 16 bpp. Please refer also to section 6.2.2 Plain video mode.

4.2.8 Distributed video

When multiple OMNIBUS devices are used to provide graphical output for the display wall, each of these OMNIBUS devices corresponds to a display area on the display wall. Input cards are always limited to provide their source just within one OMNIBUS and therefore on one display area. To achieve anyhow freely movable and scalable video windows, distributed video can be used. Distributed video can be applied to all types of sources of the input cards.

In contrast to the standard display of video (a video source is fixed to a video input of an input card), with distributed video one video source is related to a video window. This window is displayed by a group of video input cards, with one video input card located in each OMNIBUS. Depending on the location of the video window on the display wall, the video input card of the respective OMNIBUS provides the video data. If the window is located on the display areas of several OMNIBUS devices all concerned video input cards contribute »their« part of the video to the whole picture on the display wall.

Distributed video serves not only to enable unlimited upscaling, but also to have video windows that are freely movable over all display areas. One group of distributed video may display as many video windows as video channels are included. Nevertheless moving such a window into a display area where another window of this group is already displayed, assigns the new video to the video input card of that display area. Therefore the video window that has been there before appears in the background color of the window, as it is no longer provided with data.

If a group of distributed video displays several video windows all these video sources must be connected to each of the video input cards. For that purpose a video switcher can be used for the QUAD ANALOG VIDEO CARD, DUAL DVI INPUT CARD and DUAL RGB INPUT CARD. The STREAMING VIDEO CARD with its network adapter has anyhow access to all available video streams.

As many groups of distributed video can be configured and used at the same time as video channels (number of all video channels of one type of input card) are inserted in each OMNIBUS.

Distributed video is configured by means of the switcher definition file; please refer to section 6.1.3 Configuring video.

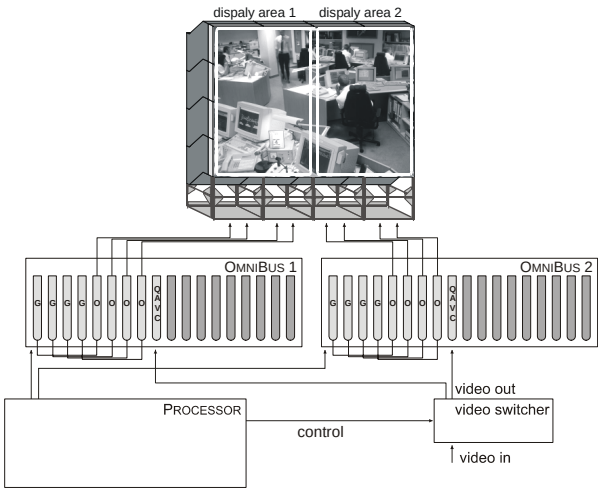


Figure 4-1
distributed video: full-screen video on two display areas

The example above shows a simplified OmniBus configuration in order to demonstrate the principles of distributed video.

4.3 Displaying video and RGB-signals

4.3.1 Display in a window

- On the PROCESSOR click the **Start** button on the taskbar and choose **Run ...** to display the **Run** dialog box.
- Enter **`video`** as the program to be opened and if necessary the options, described in the table below. Instead of the system default names as well the names defined in the switcher definition file can be inserted, see section 4.3.2 Naming of video channels and video sources.

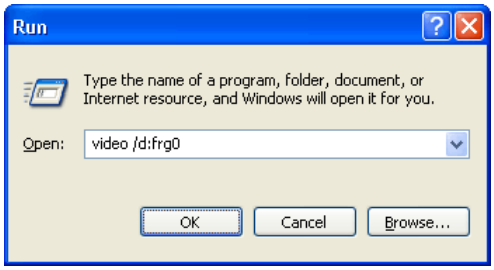


Figure 4-2
Starting the video software

- The software **video** opens the video window. With a right click on the video window a dialog box for controlling the video display can be opened. The appearance and functionality of this dialog box depends on the input card that provides the data source of the video that was started, please refer to the following sections below for a detailed description of the operation of the various source types. STREAMING VIDEO CARDS and its sources must be configured before streaming video is shown. If video does not show up please refer also to section 8.2 Other faults for troubleshooting.

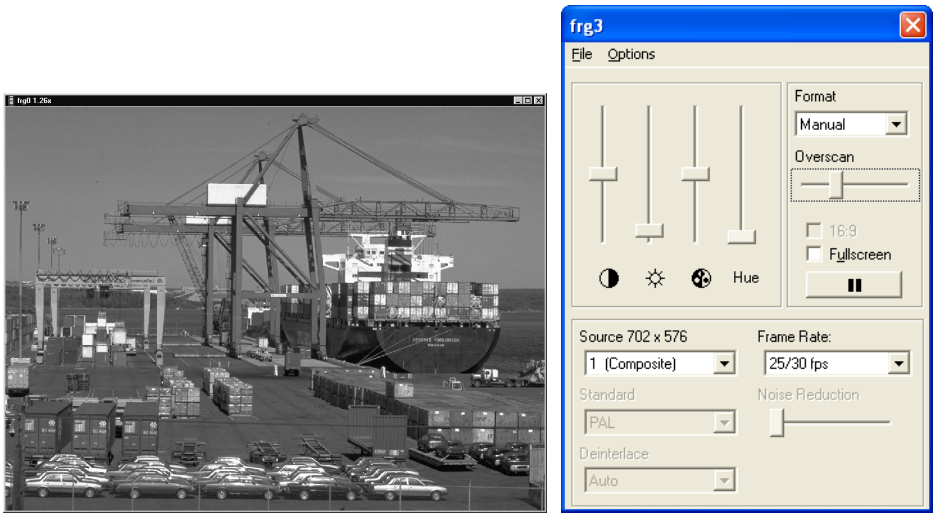


Figure 4-3
Video window and dialog box

The following table describes the available options:

`/d:<video channel>`	Specify video channel (for description see below)
`/v:<overlay>`	Specify the overlay plane. Values are: `0` use OMNISCALER, if available `1` desktop plane `2` OMNISCALER overlay plane Default is `0`.
`/c:<config.file>`	Specify configuration file (for description see below)
`/e:<event>`	Open video window that will be closed and the video software will be exited when `<event>` is sent. The same event may be associated with multiple video windows.
`/k:<event>`	Exit all videos started with option `/e:<event>`
`/t:<title>`	Set video window title. Default is the name of the video channel.
`/b[:[<alpha>][;<quality>]]]`	Enables the usage of the transparency slider on the scaler settings dialog. **alpha** sets the transparency in a range of 0 .. 255. **quality** sets the Pre-Scaling factor in a range of 0 ..14
`/w:[[v]<width>[,<height>]]` `↳ [@<x>,<y>]`	Sets size and position of video window. Mentioning just **width** and **height** sets the dimensions of the complete window. By using **v**, the dimensions refer only to the video (window borders require extra space). **v** should not be used when combining `/w` with `/f`. @ determines the upper left position of the window.
`/a:s|d|m`	Set aspect ratio of video window to **source**, **display** or **manual** unless specified with `/w:`.
`/i:<source>`	Select the source.
`/o:b|m`	Sets the frame rate to **bandwidth** 25/30 fps or **motion** 50/60 fps.
`/r:<reduction>`	Sets the dynamic reduction factor of the frame rate of the DUAL RGB INPUT CARD
`/p:<preset>`	applied to RGB channels: Selects an RGB preset (Autodetect is 0).
`/p:<StreamName>[,` `<StreamParm>=<Value>[,...]]`	applied to streaming video channels: Selects the specified stream. Parameters differing from the original stream definition can be added; if a complete set of parameters is added the streamname can be omitted. The following parameters are available. The values are set according to the description in section 4.3.5 Displaying sources of Streaming Video Card SVC-1 and SVC-2 and 4.3.6 Displaying sources of Streaming Video Card J2K.
`DstIPAddr`	**`unicast`**, **`broadcast`** or **`<nnn.nnn.nnn.nnn>`**, see **IP Address**
`DstPort`	see **Port**
`DstIPProt`	**`udp`**, **`rtp`** , see **IP Protocol**
`StreamProt`	**`auto, elementary, program, transport`**, see **Stream Protocol**
`ProgramID`	see **PID**
`SkipStart`	see **Skip byte at Start**
`SkipEnd`	see **Skip byte at End**
`SrcIPAddr`	see **IP Address** of the encoder
`Srcname`	see **Encodername** of the encoder
`SrcPort`	see **Port** number of the encoder
`SrcIPProt`	see **IP Protocol** for encoder communication
`StartString`	see **Startstring** to send to encoder for stream start
`/4` `/16`	Specify format of video source (**4:3**, **16:9**) Default is `/4` (4:3)
`/c`	Disable preset cache in the video dialog box (Input).

/f	Display video without a window (title bar, borders). Setting aspect ratio to **source** or to **display** preserves the aspect ratio of the video, setting aspect ratio to **manual** keeps the size of the display.
/k	Disable keyboard shortcuts
/m	To be used if orbiting is enabled
/p	Disable video dialog box
/s:<value>	Specify the overscan value: values ranging from 0 to 1000 corresponding to 0% to 10% overscan on each border of the image.
/t	Make video window a topmost window

Table 4-4
Options of video.exe

If using the option /c:, make sure to indicate the complete absolute or relative path to the configuration file!

Video channels and configuration files

The term video channel refers with basic video display mode to a single port of an input card. With distributed video it refers to the video that is displayed by multiple input cards in different areas of the display wall, see section 4.2.8 Distributed video.

When starting the video software, option **/d:** specifies a certain video channel, option **/c:** allows to read settings for displaying the video from a certain configuration file. If the video software is started without specifying one of these options, the first video channel to be found is selected and displayed using the default settings.

The video channels can be started by means of their default names. With basic video display mode these are `frg0`, `frg1`, `frg2`, ...

The order of the video and RGB-channels (`frg0`, `frg1`, `frg2`, ...) takes into account the order of the input cards in TransForm A, please refer to section 3.2.15 OmniBus for OmniBus configurations and section 3.2.16 Extender for Processor configurations respectively. The following example explains the order of channels for two Dual RGB Input Cards, one Quad Analog Video Card and one Streaming Video Card, where in the PCI order there is first one Dual RGB Input Card, then the Quad Analog Video Card followed by the Streaming Video Card and finally the other Dual RGB Input Card:

	video channel	name of video channel	name of default configuration file
Dual RGB Input Card 1	1	**frg0**	**default.frg0.vcf**
	2	**frg1**	**default.frg1.vcf**
Quad Analog Video Card 1	3	**frg2**	**default.frg2.vcf**
	4	**frg3**	**default.frg3.vcf**
	5	**frg4**	**default.frg4.vcf**
	6	**frg5**	**default.frg5.vcf**
Streaming Video Card 1	7	**frg6**	**default.frg6.vcf**
	8	**frg7**	**default.frg7.vcf**
	9	**frg8**	**default.frg8.vcf**
	10	**frg9**	**default.frg9.vcf**
Dual RGB-Input-Card 2	11	**frg10**	**default.frg10.vcf**
	12	**frg11**	**default.frg11.vcf**

Table 4-5

default.frg0.vcf is the corresponding default configuration file of the first channel of the first Dual RGB Input Card. After removing the Dual RGB Input Card this file would apply to the first channel of the Quad Analog Video Card.

If using the names defined in the switcher definition file for the video channels the configuration file is **`default.<name>.vcf`**.

The default configuration files are stored in the folder:

`\%USERPROFILE%\Application Data\Barco\VideoConf`

With the factory default settings the variable %USERPROFILE% is:

`?:\Documents and Settings\<`**`USER`**`>.`

If using a Streaming Video Card SVC-1 to show a source of TransForm SCN, then this source will use the first **frg** channel of the card (in the example above this would be **frg6**). The other three channels remain unused (**frg7**, **frg8** and **frg9**)!

4.3.2 Naming of video channels and video sources

To video channels and video sources of the RGB- and video input cards individual names can be assigned. The names for the video channels can be used, when starting a video window. The names of the sources will be listed to select a source in the running video software.

For the naming procedure once a switcher definition file must be built and compiled. After that the names are available.

The switcher definition file can be used to configure setups of different complexity. From a single TRANSFORM A system, where the video sources are directly connected to the input cards up to the integrated usage of video switchers, that enable to provide a lot of sources or the simultaneous usage of multiple TRANSFORM A systems. Here a simple configuration is explained. The complete description of the switcher definition file can be found in section 6.1.3 Configuring video.

Primarily the switcher language compiler must be installed. Therefore check, if the following directory exists on the PROCESSOR:

```
c:\Program Files\Barco\SLC
```

If the directory is missing, first install the compiler. Please refer to section 3.5.1 Installing the display driver and switcher language compiler.

In the directory are all files located that are needed to create the individual names:

- **example.vsw**
  is an example for a switcher definition file. You can either adopt this file to your configuration or create a new file. Nevertheless the extension of the switcher definition file must be **vsw**.
- **slc.exe**
  is the compiler. The compiler can be started from the command line. It checks syntax and structure of the configuration of the respective switcher definition file. Depending on the option, the result is displayed just on the display or it is directly edited to the registry.
- **slc.cfg**
  provides information about used hardware components for the compiler. This file must not be changed.

Example for the setup of the switcher definition file

The switcher definition file consists of multiple sections. Depending on the described system some sections can be left out or must be used. Parts that are not used can as well be commented by means of the `/*` and `*/` characters at the beginning, respectively end of the commented part. Twice a slash `//` comments all characters to its right in the same line.

Here a simple example is given to explain the switcher definition file. It consists of a TRANSFORM A in OmniBus configuration with two QUAD ANALOG VIDEO CARDS. They are located in two different OMNIBUS devices. Two channels of a card are grouped with the respective channels of the other card to show distributed video. One card displays with the third channel an additional video window. For this configuration the following sections are used:

- **Grabber**
  To each used input of the QUAD ANALOG VIDEO CARDS an individual name is assigned.
- **DFRG**
  One or multiple **Grabber** get a name as video channel.
- **Sourcelist**
  All analog sources get a name and their video- / RGB-type gets defined. The sources get combined to groups, the **Sourcelists**.
- **Route**
  Here it is determined which Sourcelist must be available at which input cards (**Grabber**) or **DFRG**.
- **Cables**
  This section describes the cabling of each source to the individual inputs of each input card.

Grabber

To the video inputs of the QUAD ANALOG VIDEO CARD we assign the names QAVC-1, QAVC-2, ... , QAVC-5 in the five **Grabber** sections. The grabber name (here QAVC-x) can be chosen freely unless it does not start with a digit or is a default name of the system (`frg0`, `frg1`, ...). After the keyword `device=` the respective card is written. A list with the identifiers can be found in Table 6-16. The number of the input is indicated in square brackets.

```
Grabber "QAVC-1"
{
     device=frg3008[0];
}
Grabber "QAVC-2"
{
     device=frg3008[1];
}
Grabber "QAVC-3"
{
     device=frg3008[4];
}
Grabber "QAVC-4"
{
     device=frg3008[5];
}
Grabber "QAVC-5"
{
     device=frg3008[6];
}
```

If you assign in the GRABBER section a new name to a device, this device can no longer by addressed with its default name (e.g. `frg1`). Instead only the GRABBER name (`QAVC-2`) can be used. All devices with higher frg-default names move up by one (e.g. `frg2` becomes `frg1`, `frg3` becomes `frg2` ...).

DFRG

In the section **DFRG** the names of the video channels are defined. These names can be used to start a video channel with the **video** software. Within one DFRG section one single card for basic video display mode can be listed (e.g. `Vid1`), or multiple cards of different OMNIBUS devices can be listed to form a distributed video (e.g. `DVid1, DVid2`).

```
DFRG "DVid1"                // define dfrg device with members
{
     QAVC-1, QAVC-3;
}
DFRG "DVid2"
{
     QAVC-2, QAVC-4;
}
DFRG "Vid1"
{
     QAVC-5;
}
```

Sourcelist

In the section **Sourcelist** all used sources are listed. In each of the lines there is the name in quotes, followed by the video type and the video standard. It is possible to have multiple **Sourcelists**, nevertheless it is necessary to have at least one of them.

The **Sourcelist** serves to assign their sources in the section **ROUTES** to the **DFRG** channels.

```
Sourcelist "Sources a"      // defining video sources
{
    "RTL", Composite, PAL;
}

Sourcelist "Sources b"
{
    "SAT 1", SVideo, PAL;
}
```

ROUTES

In the section **ROUTES** is defined, which **Sourcelist** is available for which video channels (**DFRG**). In each line there is first mentioned the **Sourcelist** in quotes, followed by the keyword **`to`** and finally the **DFRG** channel.

```
ROUTES
{
     "Sources a" to DVid1;
     "Sources b" to DVid2;
     "Sources c" to Vid1;
}
```

CABLES

In the section **CABLES** the cabling is exactly described. To each video source defined in **Sourcelist** (not the **Sourcelist** itself) must be assigned the input of an input card. For the numbering of the inputs please refer to the sections 3.2.7 Quad Analog Video Card, 3.2.8 Streaming Video Card, 3.2.9 Quad SDI Video Card, 3.2.10 Dual DVI Input Card and 3.2.11 Dual RGB Input Card.

Into one line first the name of the video source in quotes is written followed by the keyword **to**. Then all video inputs of the input cards that are connected to that source are listed, separated by comma. To identify the video inputs the name assigned in section **Grabber** can be used. Appended to that name, separated by a point the connected port must be identified (this is with the used cards always 1).

```
CABLES                      // define wiring
{
     "RTL"    to QAVC-1.1, QAVC-3.1;
     "SAT 1"  to QAVC-2.1, QAVC-4.1;
     "NTV"    to QAVC-5.1;
}
```

The compiler

When the switcher definition file is edited and saved it must be compiled. Therefore in a command line change to the following directory:

```
c:\Program Files\Barco\SLC
```

The compiler is executed by the command **slc.exe**. The name of the switcher definition file with the respective option is appended:

```
c:\Program Files\Barco\SLC>slc.exe example.vsw –f
```

The option **-f** makes sure that there is just an analysis, if the description is correct. The result is showed on the display but there are no changes to the registry. If the result contains neither errors nor warnings **slc.exe** can be started anew, but now without the option **-f**. Then the description of the switcher definition file is adapted to the registry.

```
c:\Program Files\Barco\SLC>slc.exe example.vsw
```

4.3.3 Video software

With a right click on a window its control panel can be opened. The control panel differs to a greater or lesser extend depending on the type of the input card and the signal type, please refer to section 4.3.4 Displaying sources of Quad Analog Video Card and the following. Most properties of the video can also be controlled by means of keyboard shortcuts. The menu structure offers access to additional functionality.

Figure 4-4
Video window and dialog box

Menus in the video dialog box

The **File** and **Options** menus allow the administration of **configuration files** and **preset files**. **Settings** can be stored in configuration files for later program calls.

Also, the module related display of video i.e. not within the window but on one or several projection modules or on the whole display wall can be controlled.

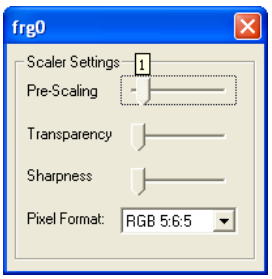
File	
Open Settings ...	Load a set of settings from a configuration file.
Save Settings	Save current settings in a configuration file.
Save Settings As ...	Save current settings under a different name.
Import / Export Presets	*Only applicable for RGB channels:* Import or export a preset file; please refer to section 4.3.10 Configuration of analog RGB and YUV input
Read EDID Prom	*Only applicable for DUAL DVI INPUT CARD:* read EDID data from the EDID PROM and save it to a file please refer to section 4.3.8 Displaying sources of Dual DVI Input Card
Write EDID Prom	*Only applicable for DUAL DVI INPUT CARD:* read EDID data from a file and write it to the EDID PROM
Exit	Quit the video software.

Options		
Save Settings on Exit	Settings are saved on exit.	
Save Window Position on Exit	Position of video window is saved on exit.	
Restore Defaults	Return to the original settings of a configuration.	
User Interface	**Fullscreen Means Channel Video**	In full-screen mode the video is displayed on all projection cubes, which display currently a part of it.
	Enable Cropping	Dragging a border of the window inwards cuts the window. The video/RGB image is cropped accordingly. Dragging then the lower left corner outwards enlarges the cropped portion of the video. Cropping is a prerequisite for usage of the zoom function of the mouse, please see below!
	Enable Keyboard Shortcuts	Frequently used commands can be entered with the keyboard as well as with the mouse; please see below.
	Left Click Pauses	Left click in the video window results in freeze / return to play
	List Source Names	In the input list the source names are listed
	Resize immediately	Video is resized while the video window is resized
Video Window Title	**Device**	The device name is displayed in the video window title
	Source	The source name is displayed in the video window title
	Window Size	The window size is displayed in the video window title
	Window Position	The window position is displayed in the video window title
	Scaling Factor	The scaling factor is displayed in the video window title
	Show Clock	Display a digital clock positioned on the video. Only enabled after starting video with the option **/b**
Board settings	Only applicable for Streaming Video Cards: Open the dialog to edit the board settings	
Scaler Settings	Open the dialog to edit output settings of the OMNISCALER	

Table 4-6
Menus in the control panel

Scaler settings dialog box

In the **Scaler Settings** dialog box the settings for video processing in the OMNISCALER can be set.



Scaler Settings	
Pre-Scaling	sets the pre-scale factor: video data is in the input card downscaled with the set factor and up-scaled accordingly in the OMNISCALER. **0 16 of 16 pixels in x and y direction remain -> no prescaling, default** **1 15 of 16 pixels in x and y direction remain** **...** **8 8 of 16 pixels in x and y direction remain -> ¼ of the whole amount of pixels remains** **...** **15 1 of 16 pixels in x and y direction remains**
Transparency	defines the transparency of graphic objects on the RGB window, e.g the clock, default is 0

Sharpness	adjustment of sharpness factor, default is 0
Pixel Format	*For video sources:* **YUV 4:2:2 (16 bpp) – Default, optimal video quality and bandwidth efficiency** **RGB 5:6:5 (16 bpp) or RGB 8:8:8 (24 bpp) – should not be selected (only for test purposes)** *For sources of DUAL DVI INPUT CARD:* **YUV 4:2:2 (16 bpp), RGB 5:6:5 (16 bpp) or RGB 8:8:8 (24 bpp) – Default depending on source type** *For source of DUAL RGB INPUT CARD:* **RGB 5:6:5 (16 bpp) – Default, optimal bandwidth efficiency** **RGB 8:8:8 (24 bpp) – high color depth image, but bandwidth demanding** *For all source types:* **XRGB 8:8:8:8 (32 bpp) – should not be selected (only for test purposes); excessive bandwidth consumption**

Figure 4-5
Scaler Settings dialog box

Keyboard shortcuts

Frequently used commands can be entered with the keyboard (left column) or with the mouse and some additional key strokes (middle column). Most commands are valid for all type of sources and input cards. But there are also some individual commands which apply only to one type of input.

Keyboard	Mouse	Meaning
Video window		
Pause	Left-click in video window	Freeze on/off if the source is frozen most display settings cannot be changed
	Drag corner of video window	Change size of video window and video
	Drag border of video window	Change size of video window in one direction; if cropping is enabled the video gets cropped, if cropping is disabled the video gets stretched/contracted, if in addition the Format *Source/Display* is selected the aspect ratio of the window is maintained.
	Drag within video window	Zoom-in selected area; only available, if cropping is enabled and if the Format *Manual* is selected
	Hold **Shift** and left-click	Zoom-in to mouse pointer; only available, if cropping is enabled and if the Format *Manual* is selected
Backspace	Hold **Ctrl** and left-click	Zoom-out from mouse pointer; only available, if cropping is enabled and if the Format *Manual* is selected
F5	Left-click and right-click in video window	Full-screen mode on/off
Shift F5		Constant aspect ratio in full-screen mode on/off
Ctrl F5		Channel video on/off
F6		Switch from 4:3 to 16:9 aspect ratio of video sources
F7	Double-click	Video shown uncropped
F8		Standard size and video shown uncropped
F10	Right-click	Show control panel
Shift F10		Show scaler settings dialog box
For DUAL DVI INPUT CARD only:		
1		Select video channel (composite)
2		Select video channel (S-video)
3		Select RGB channel (RGB analog)
4		Select video channel (component)
5		Select RGB channel (RGB digital)
a		Auto detection of screen mode for channels **3** and **4** only
For DUAL RGB INPUT CARD only:		

1 **a**		Enable RGB channel Auto detection of screen mode
All other video input cards:		
1		Enable video channel
All input cards:		
0		Disable video/RGB channel
For video sources and sources of DUAL DVI INPUT CARD:		
c **b** **s**		Contrast (setting with direction keys) Brightness (setting with direction keys) Color saturation (setting with direction keys)
For QUAD ANALOG VIDEO CARD and S-Video sources of DUAL DVI INPUT CARD:		
h		Hue, only for NTSC sources (setting with direction keys)
For RGB sources of DUAL RGB INPUT CARD and DUAL DVI INPUT CARD:		
Shift r **Shift g** **Shift b**		Red (setting with direction keys) Green (setting with direction keys) Blue (setting with direction keys)
For sources of DUAL RGB INPUT CARD:		
b		Brightness (setting with direction keys)
For sources of DUAL DVI INPUT CARD and DUAL RGB INPUT CARD:		
r		Frame rate reduction (setting with direction keys)
All input cards:		
<up> **<down>** ** **		Increase the selected value Decrease the selected value Set default value
Video dialog box		
<up> **<down>** ** **	Drag up Drag down Right-click	Increase the selected value Decrease the selected value Set default value

Table 4-7
Short cuts for controlling the video or RGB window

4.3.4 Displaying sources of Quad Analog Video Card

With a right click on the window of a QUAD ANALOG VIDEO CARD the control panel for this type of video can be opened.

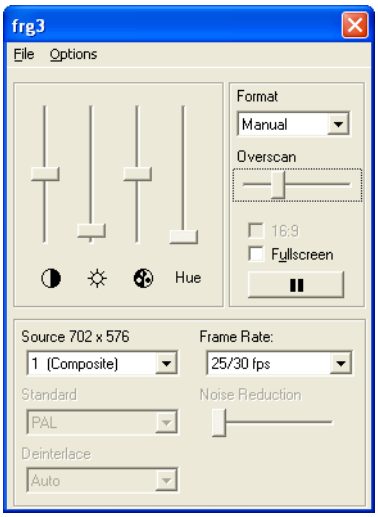


Figure 4-6
QUAD ANALOG VIDEO CARD – dialog box

	Setting of contrast	
	Setting of brightness	
	Setting of saturation	
Hue	*not applicable*	
Format	**Source**	Switch to native aspect ratio of source
	Display	Switch to native aspect ratio of projection module
	Manual	Resize x and y independently
Overscan	The edges of video often show disturbances; therefore an overscan of some % can be defined that will not be displayed. Values between 0% and 10% are possible Default: 3%	
16:9	Switch to 16:9 aspect ratio. Not applicable, if the Format **Manual** is selected.	
Fullscreen	Scale the video up to the whole display wall or in **Channel Video** mode to the projection cubes, which currently display a part of it.	
	Freeze / return to play (if the source is frozen, none of the displaying settings can be changed and the Scaler settings dialog cannot be opened)	
Source	Selection of the video ports. Shows also the resolution of the incoming signal	
	0 (Disabled)	Video channel disabled
	1 (Composite)	Select a composite video signal.
Frame Rate	Setting of the used frame rate, default is 25/30 fps depending on the video standard, in addition 50/60 fps are selectable.	
Standard	Displays the detected video standard. The standards **NTSC**, **PAL**, **SECAM**, **BW 50Hz** (Black and white at 50 frames per second (PAL, SECAM)), **BW 60Hz** (Black and white at 60 frames per second (NTSC)) are displayed. Also sub-standards may be displayed.	
Noise Reduction	*not applicable*	
Deinterlace	*not applicable*	

Table 4-8
Video dialog box – QUAD ANALOG VIDEO CARD

4.3.5 Displaying sources of Streaming Video Card SVC-1 and SVC-2

With a right click on the window of streaming video the control panel for this type of video can be opened.

Before being able to display streaming video, first the Streaming Video Card must be configured, please refer to entry Board settings below, also the streams must be edited, please refer to the menu entry Edit below!

Everytime starting a video channel for streaming video the desired stream must be selected from the Streams parameters Editor or, when starting the video command line based, the option /p:<StreamName> must be indicated.

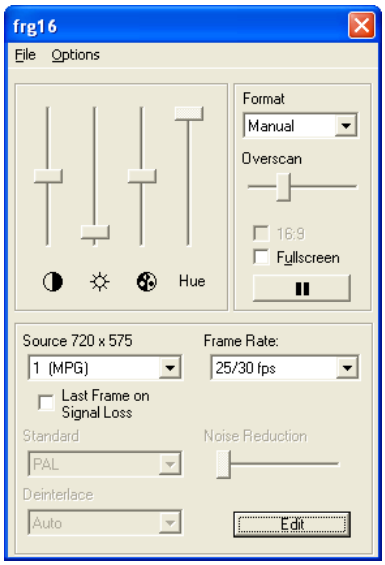


Figure 4-7
STREAMING VIDEO CARD SVC-1 and SVC-2 – dialog box

	Setting of contrast	
	Setting of brightness	
	Setting of saturation	
Hue	*not applicable*	
Format	**Source**	Switch to native aspect ratio of source
	Display	Switch to native aspect ratio of projection module
	Manual	Resize x and y independently
Overscan	The edges of video often show disturbances; therefore an overscan of some % can be defined that will not be displayed. Range: 0% – 10%, default: 3%, default SCN: 0%	
16:9	Switch to 16:9 aspect ratio. Not applicable, if the Format **Manual** is selected.	
Fullscreen	Scale the video up to the whole display wall or in **Channel Video** mode to the projection cubes, which currently display a part of it.	
	Freeze / return to play (if the source is frozen, none of the displaying settings can be changed and the Scaler settings dialog cannot be opened)	
Source	Selection of the video ports. Shows also the resolution of the incoming signal	
	0 (Disabled)	Video channel disabled
	1 (MPG)	Auto-selected
Frame Rate	Setting of the used frame rate, default is 25/30 fps depending on the video standard, in addition 50/60 fps are selectable.	
Last Frame on Signal Loss	Displays the last frame in case of signal loss. Otherwise a blue window is displayed instead.	
Standard	Displays the detected video standard. Possible standards: **PAL**, **NTSC**	

Deinterlace	*not applicable*
Noise Reduction	*not applicable*
Edit	Opens the **Stream Parameter Editor**, to configure the STREAMING VIDEO CARD, please see below!

Table 4-9
Video dialog box – STREAMING VIDEO CARD

Configuring Streaming Video Card SVC-1 and SVC-2

For each STREAMING VIDEO CARD SVC-1 and SVC-2 once the configuration parameters must be entered into the **Board Settings** dialog, therefore select **Board Settings** from the **Options** menu.

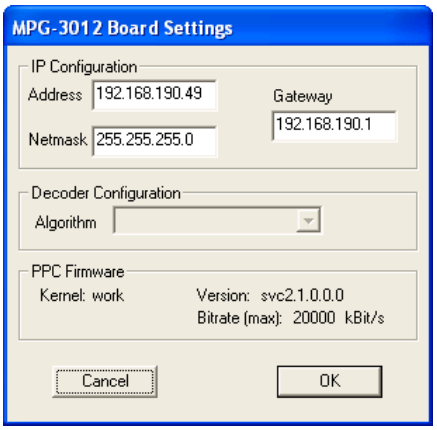


Figure 4-8
Board Settings dialog of the STREAMING VIDEO CARD SVC-1 or SVC-2

IP Configuration	
Address	IP address of the STREAMING VIDEO CARD SVC-1 and SVC-2. Each STREAMING VIDEO CARD SVC-1 and SVC-2 needs its own, fixed IP address
Netmask	Netmask of the STREAMING VIDEO CARD SVC-1 and SVC-2, must be the same value for all cards
Gateway	Gateway must be the same value for all cards. Even if the network does not require an indication of the Gateway, a value must be filled in.
Decoder Configuration	
Algorithm	List of the supported decoder algorithms. For STREAMING VIDEO CARD SVC-1: All video streams processed by one card must have the same compression algorithm. Possible algorithms are: **h263**, **mjpeg**, **mpeg2**, **mpeg4_sp**, **mxpeg**, **scn_dec**, **visiowave**, **vnc**. For STREAMING VIDEO CARD SVC-2 the decoder algorithm is determined per stream. It is defined with the Stream Parameters Editor, please see below.
PCC Firmware	provides information on the current operating state and the firmware version
Version	Card type and firmware version: the first four digits indicate the card itself, the following digits indicate the firmware version. E.g. **svc2.1.0.0.0** stands for a STREAMING VIDEO CARD SVC-2 with firmware 1.0.0.0

Table 4-10

When assigning a stream to a Streaming Video Card SVC-1, which has a different decoder algorithm than the one displayed before, the order in which the configuration changes are done, must be considered:

- **First select the suitable decoder algorithm in the Board Settings dialog.**
- **Then adjust the stream parameters and display it.**

Configuring video streams

The parameters of a video stream must be defined in this **Stream Params Editor**, before the STREAMING VIDEO CARD can display it. Once defined it is available for every STREAMING VIDEO CARD in the system. To open the **Stream Params Editor** press **Edit** on the control panel.

Pressing the **Add** button adds a new stream with the entered name into the **Streams** list. The parameters that are displayed at that time are saved together with it. If an entry with the same name already exists its parameters are not changed. Pressing the **Apply** button applies the displayed parameters to the hardware. In that way changes can be controlled directly. Pressing the **OK** button applies the parameters to the hardware and to the registry. Pressing the **Cancel** button closes the window, anyhow changes that are already confirmed with the **Add** or **Delete** button cannot be revoked.

Stream parameters for streams of Streaming Video Card SVC-1, SVC-2 and J2K are commonly stored and listed. If using different type of Streaming Video Cards in one system take care to select stream parameters that suite the card type!

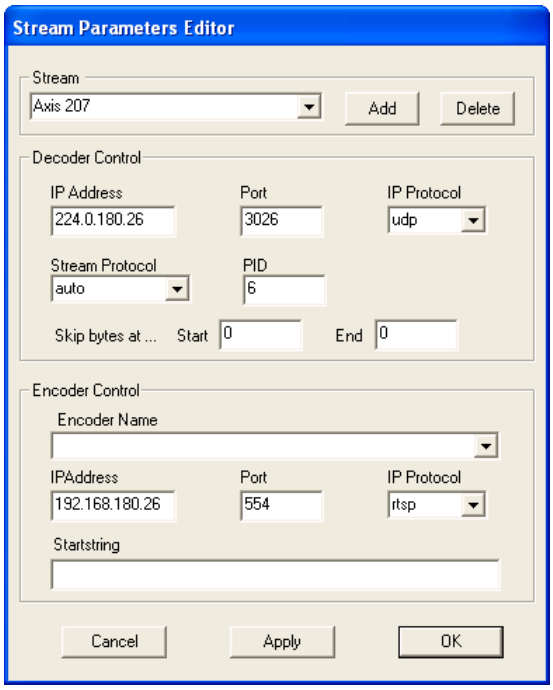


Figure 4-9
Stream Parameter Editor of the STREAMING VIDEO CARD SVC-1 or SVC-2

The configuration of a stream differs depending on using STREAMING VIDEO CARD SVC-1 or STREAMING VIDEO CARD SVC-2:

Streaming Video Card SVC-2

The STREAMING VIDEO CARD SVC-2 can be configured in two different modes: **list mode** and **ID selection mode**. These two modes differ in identifying the encoder type and compression algorithm either by a digit entered in the **PID** field or by selecting it from the **Encoder Name** list. By doing so a principal selection is made. In case that the STREAMING VIDEO CARD SVC-2 is used in a system together with STREAMING VIDEO CARDS SVC-1, it is recommended to use **ID selection mode**.

- **List mode**
  Provides readable selections for encoder and compression algorithm selection.
  List mode is supported from firmware 1.0.0.0 of the STREAMING VIDEO CARDS SVC-2 on.
- **ID selection mode:**
  Enables to use one stream for STREAMING VIDEO CARDS SVC-1 and SVC-2.

Stream	A list of all video streams in alphabetic order. Stream names have to start with a letter; initial digits may not be used!
Decoder Control	
IP Address	enter a unicast IP address, to receive a unicast stream, enter a multicast IP address, to receive a multicast stream
Port	Stream port, appendant to the IP address.
IP Protocol	*Not applicable, but the default value **udp** should not be changed.*
Stream Protocol	*Not applicable, but the default value **auto** should not be changed.*
PID	**ID selection mode:** A specific encoder configuration is selected by entering the suitable number. Please select the respective configuration number from the encoder configuration list below. **List mode:** Should be entered for transport streams when the PAT (program allocation tables) or PMT (program map tables) are not sent. **0** is a predefined value. It causes an auto-search for the video PID. If no valid PID is found no video will be shown.
Skip bytes at Start / End	*Not applicable, but the default value **0** should not be changed.*
Encoder Control	This section contains data that is used, if initial communication with the encoder is needed to prompt the encoder to setup a stream.
Encoder Name	**ID selection mode:** This field must be empty. (To remove a selection, select the field and press the DEL-key.) **List mode:** Selection of the appropriate encoder configuration
IP Address	IP address of the encoder. Indication is mandatory to evaluate information of this section!
Port	Port where the encoder listens to TCP start commands.
IP Protocol	*Not applicable, but the default value **udp** should not be changed.*
Startstring	String that is additionally sent to the specified encoder. A suitable startstring is automatically provided, by selecting **PID** above, if applicable.

Figure 4-10
Parameters on the Streams Parameters Editor for STREAMING VIDEO CARD SVC-2

As unicast streams are only sent to one single IP address, only one Streaming Video Card at a time is able to display one particular unicast stream.

The numbers indicating the encoder configuration are numbered according to the order in which they are listed in the Encoder Name list. For an easy assignment they are also given in the list below, which is valid for firmware version 1.0.0.0.

The name of the encoder configuration contains the encoder name, the algorithm type, the layer, the transport protocol and an indication whether unicast or multicast is used. Categories that are not applicable are omitted.

Configuration number (PID)	Encoder: encodername_algorithm_layer_transportprotocol_unicast/multicast
1	impath_mpeg2_elem_udp
2	impath_mpeg2_sys_udp_multi
3	nkf_mpeg2_sys_rtp_multi
4	nkf_mpeg4_elem_rtp
5	mavix_mpeg4_elem_udp
6	axis_mpeg4_elem_rtsp_multi
7	axis_mpeg4_elem_rtsp_unicast
8	hisome_mpeg4_system_udp
9	visiowave_multi
10	visiowave_uni
11	cieffe_mpeg4_elem_udp
12	teleste_mpeg4_elem_rtp
13	verint_mpeg4_elem_rtp
14	coretec_mpeg4_elem_rtp
15	vbrick_mpeg4_elem_rtp
16	cornet_mpeg4_elem_rtp
17	acti_mpeg4_elem_rtp
18	videobridge_mpeg4_elem_rtp
19	coe_mpeg4_elem_rtsp_uni
20	sony_mpeg4_elem_rtp_multi
21	sony_mpeg4_elem_rtp_uni
22	vlc_mpeg4_ts
23	nice_mpeg4_elem_rtp_multi

Table 4-11
Encoder dependant PIDs for STREAMING VIDEO CARD SVC-2

Streaming Video Card SVC-1

Stream	A list of all video streams in alphabetic order. Stream names have to start with a letter; initial digits may not be used!	
Decoder Control		
IP Address	enter **unicast**, if receiving a unicast stream, enter **broadcast**, if receiving a broadcast stream, enter the multicast IP address, if receiving a multicast stream	
Port	Encoder port, appendant to the IP address.	
IP Protocol	Selection of the used IP protocol. (firmware < 2.0 of the STREAMING VIDEO CARD SVC-1 supports only **UDP**)	
Stream Protocol	**auto**	Auto-detection of the stream type
	elementary	Elementary stream
	program	Program stream
	transport	Transport stream
PID	Should be entered for transport streams when the PAT (program allocation tables) or PMT (program map tables) are not sent. **0** is a predefined value. It causes an auto-search for the video PID. If no valid PID is found no video will be shown.	
Skip bytes at ...		
Start **End**	Encoder dependent value of the number of bytes that must be skipped at the beginning / end of each packet, please see table below.	
Encoder Control	This section contains data that is used, if initial communication with the encoder is needed to prompt the encoder to send a stream.	
Encoder Name	*Not applicable. Make sure that this field remains empty.*	
IP Address	IP address of the encoder. Required to evaluate information of this section!	
Port	Port where the encoder listens to TCP start commands.	
IP Protocol	IP protocol that is used for encoder communication, **UDP** or **TCP** is selectable	
Startstring	String that is sent to the specified encoder	

Figure 4-11
Parameters on the Streams Parameters Editor

As unicast streams are only sent to one single IP address, only one Streaming Video Card at a time is able to display one particular unicast stream.

The following table lists the encoder specific values that must be entered into the **Streams Params Editor**. They are valid with STREAMING VIDEO CARD SVC-1 with firmware 6.0.1.21.

Encoder **manufacturer – type**	**compression algorythm**	**IP protocol**	**Skip bytes at start**	**Skip bytes at end**	**Stream protocol**	**TCP**	**PID**
AXIS –	mjpeg	TCP	0	0	auto	ON	0
	Use port 80 for TCP and indicate the encoder IP address; signaling method is http; signaling is supported.						
206	Startstring example: `Axis241Q://GET /axis-cgi/mjpg/video.cgi HTTP/1.0\n\n`						
206M	Startstring example: `Axis241Q://GET /axis-cgi/mjpg/video.cgi HTTP/1.0\n\n` Resolutions with 1280 horizontal pixels are not supported.						

Encoder **manufacturer – type**	**compression algorythm**	**IP protocol**	**Skip bytes at start**	**Skip bytes at end**	**Stream protocol**	**TCP**	**PID**
207 / 207W / 210 / 210A / 211 / 211A / 213 PTZ / 214 PTZ / 216FD / 225FD / 231D / 231D+ / 232D / 232D+ / 241S / 241SA / 242S IV	Startstring example: `Axis241Q://GET /axis-cgi/mjpg/ video.cgi HTTP/1.0\n\n`						
221	Startstring example: `Axis241Q://GET /axis-cgi/mjpg/ video.cgi HTTP/1.0\n\n` Up to 30 frames/sec						
240Q	Startstring example: `Axis241Q://GET /axis-cgi/mjpg/ video.cgi?camera=1 HTTP/1.0\n\n`						
241Q / 241QA	Startstring example: `Axis241Q://GET /axis-cgi/mjpg/ video.cgi?camera=1 HTTP/1.0\n\n` A maximum use of 4 4CIF streams with a maximum quality of 75% (or at least 25% compression) is recommended.						
Barco – TransForm SCN	scn	UDP	0	0	auto	OFF	0
BOSCH – NWC-0455 Dinion / NWC-0455 DinionXF / VideoJet8008 / VIP X1 / VIP X1600 / VIP X2	h263	RTP	0	0	auto	ON	0
	No on-board RCP+ support; I-frame distance may not be 0. Startstring example: `VIP X`						
BOSCH – Videojet 10 / Videojet 1000 / Videojet Xpro / VIP 10 / VIP 1000	h263	RTP	0	0	auto	OFF	0
	No on-board RCP+ support; I-frame distance may not be 0.						
BOSCH – Videojet 1000 / Videojet 8000 / Videojet Xpro / VIP 1000	mpeg2	RTP	4	0	auto	OFF	0
	No on-board RCP+ support.						
Cieffe – NETTUNO	mpeg4	UDP	0	0	auto	OFF	0
Coretec – VCX-2400-E	mpeg2	UDP	0	0	auto	OFF	0
Cornet – iVDO Streamer 2/4 Encoder	mpeg2	UDP	0	0	auto	OFF	0
Cornet – iVDO Streamer 2/4 Encoder	mpeg4	RTP	0	0	auto	OFF	0
DVTeL – 7601e	mpeg4	RTP	0	0	auto	ON	0
	Use port 3000 for TCP, Startstring example: `SmartSight`						
Exterity – A/V server	mpeg2	RTP/UDP	0 /4	0	auto	OFF	0
	IP protocol: for Transport/UDP = UDP for Transport/RTP and Elementary = RTP SkipAtStart: for Elementary = 4, else = 0						
GE Security (Visiowave) – Discovery 2400 / Discovery 300 (Visiobox) / Evolution HD	2D wavelet	UDP	0	0	auto	ON	0
	Use the encoder TCP port for TCP, Startstring example: `Visiobox` Signaling method is TCP, signaling is supported.						
HaiVision – Hai210	mpeg2	UDP	0	0	auto	OFF	0
Hi Tron – e-Videoserver	mpeg4	RTP	0	0	auto	OFF	0
	No usage of Advanced simple profile. Encoder must be set to “Send to (Client) IP”						

Encoder **manufacturer – type**	**compression algorythm**	**IP protocol**	**Skip bytes at start**	**Skip bytes at end**	**Stream protocol**	**TCP**	**PID**
iMPath – i1000	mpeg2	UDP	0	0	auto	OFF	0
iMPath – i4000	mpeg2	RTP/UDP	0	0	auto	OFF	0
	RTP or UDP has to be configured in accordance with the encoder configuration.						
IndigoVision – VideoBridge™ 8000 881 / 8000 882	mpeg4	TCP	0	0	element.	ON	0
	Use port 49500 for TCP; for each encoder the streaming port must be different. TCP is enabled without sending a string. The Barco Indigovision interface tool is required for the streaming!						
IndigoVision – VideoBridge™ 8000 882	mpeg4	RTP	0	0	auto	OFF	0
	The Barco Indigovision interface tool is required for the streaming!						
JVC – VN-C655U	mjpeg	UDP	0	0	auto	OFF	0
	Software viewer is needed to start the multicast stream and for keep-alive.						
LANACCESS – onSafe MPEG2	mpeg2	RTP	0	0	auto	OFF	0
LANACCESS – onSafe MPEG4	mpeg4	-	-	-	-	OFF	-
Lenel – Network vido recorder	mjpeg	UDP	0	0	auto	OFF	0
	TCP is not enabled for the Streaming video card.						
Mavix – MediaRacer 100 / MediaRacer 150	mpeg2	UDP	12	0	auto	ON	0
	Multiple ports for TCP possible, Startstring: `Mavix`						
Mavix – MediaRacer 100 / MediaRacer 150	mpeg4	UDP	12	0	auto	ON	0
	Multiple ports for TCP possible, Startstring: `Mavix`						
Mobotix – D10Di-FixDome / M22	mxpeg	UDP	0	0	auto	ON	0
	Startstring: `Mobotix://GET /control/faststream.jpg?` `↳ stream=MxPEG&fps=25.000 HTTP/1.0\n\n` Signaling method is HTTP, signaling is supported. The stream is a unicast stream. Resolutions up to 1280×576 supported.						
NiceVision (Fast Video Security) – ENC 8M2	mpeg2	RTP	4	0	auto	OFF	0
NiceVision – Recorder Pro	mpeg4	RTP	0	0	auto	OFF	0
	Only CIF resolution, only I and P frames are used. No successive Video Object Plane (VOP) start markers without data (used in recorded streams); Stream must be multicasted and always available on the network (no stream setup signaling required).						
Optelecom-NKF – c15 / c20 / CS20	mpeg2	RTP	0	0	auto	OFF	0
	The Ethernet interfaces must be set to **Forced 100 Mbps Full Duplex**, when connecting to an NKF Switch.						
Optibase – MGW3100	mpeg2	–	–	–	auto	OFF	–
Path 1 – Cx 1800	mpeg2	UDP	0	0	auto	OFF	0
Pelco – PelcoNet NET350	h263	RTP	0	0	auto	OFF	0
	I-frame distance may not be 0.						
Pelco – PelcoNet NET4001A	mpeg2	RTP	4	0	auto	OFF	0
	No on-board RCP+ support.						

Encoder **manufacturer – type**	**compression algorythm**	**IP protocol**	**Skip bytes at start**	**Skip bytes at end**	**Stream protocol**	**TCP**	**PID**
Pelco – PelcoNet NET4001A	h263	RTP	0	0	auto	OFF	0
	No on-board RCP+ support; limited frame rate.						
Siemens OTN – MVIDIP	mpeg2	–	–	–	–	OFF	–
Siemens OTN – MVIDIP	mpeg4	RTP	0	0	auto	OFF	0
Tandberg – E5710	mpeg2	–	–	–	–	OFF	–
Tandberg – Mediaplex-20	mpeg2	UDP	0	0	auto	OFF	0
Tandberg – TT6120	mpeg2	UDP	0	0	auto	OFF	0, 1, ...
	Generates multiple-program transport streams (MPTS). The Video PID is used to select the program.						
Tandberg – TT7116	mpeg2	UDP	0	0	auto	OFF	590
Teleste – EASI BLUEbox / EASI IPET1 / EASI IPET3 / EASI MoRIS	mpeg2	UDP	0	0	auto	OFF	0
Teleste – EASI MoRIS / EASI MPC-E1 / EASI MPC-E2 / EASI MPC-E4 / EASI MPX-E8	mpeg4	RTP	0	0	auto	OFF	0
Telindus – Cellstack Centauri	mpeg2	RTP	0	0	auto	OFF	0
VBrick – VB4000 / VB6000	mpeg2	UDP	0	0	auto	OFF	0
	ISMA features not supported.						
VBrick – VBXcast 9140-4200 / VBXcast 9140-4300	mpeg4	UDP	12	0	auto	OFF	0
	ISMA features not supported.						
Verint – S1500e / S1600e-T	mpeg4	RTP	0	0	auto	ON	0
	Startstring example: `SmartSight` Only with encoder firmware 3.20 build 444. Usage of S1700e recommend.						
Verint – S1700e	mpeg4	RTP	0	0	auto	ON	0
	startstring example: `SmartSight`						
VideoLAN – VideoLAN (VLC/VLS)	mpeg2 mpeg4 mjpeg	see below:	0	0	auto	OFF	0
	For IP protocol multicast, unicast, UDP or RTP is possible.						
Vorx – VON v1.0	mpeg2 mpeg4	UDP	0	0	auto	OFF	0
	Decoding of AES streams is not supported.						

Table 4-12
Encoder dependant parameter values for STREAMING VIDEO CARD SVC-1

For some encoders the settings are not defined, if there are difficulties to set them, please contact the Barco support, see section 8.3 Contact**.**

4.3.6 Displaying sources of Streaming Video Card J2K

With a right click on the window that is displaying a JPEG2000 video stream the control panel for this type of video can be opened.

The first time the software video.exe is opened for a channel of a Streaming Video Card J2K, the video will not be displayed automatically. This is because the Streaming Video Card must first be configured, please refer to entry Edit below, also the streams must be edited, please refer to the menu entry Board settings below!

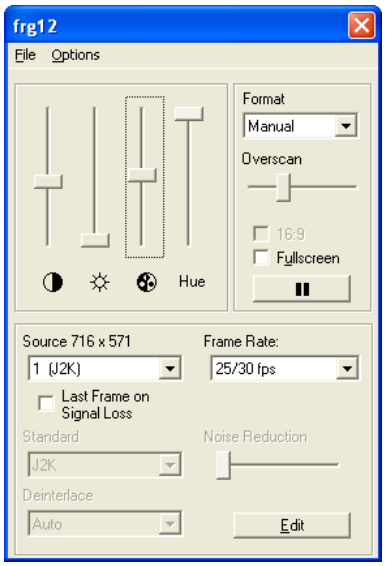


Figure 4-12
STREAMING VIDEO CARD J2K – dialog box

	Setting of contrast	
	Setting of brightness	
	Setting of saturation	
Hue	*not applicable*	
Format	**Source**	Switch to native aspect ratio of source
	Display	Switch to native aspect ratio of projection module
	Manual	Resize x and y independently
Overscan	The edges of video often show disturbances; therefore an overscan of some % can be defined that will not be displayed. Values between 0% and 10% are possible, default is 3%	
16:9	Switch to 16:9 aspect ratio. Not applicable, if the Format **Manual** is selected.	
Fullscreen	Scale the video up to the whole display wall or in **Channel Video** mode to the projection cubes, which currently display a part of it.	
II	Freeze / return to play (if the source is frozen, none of the displaying settings can be changed and the Scaler settings dialog cannot be opened)	
Source	Selection of the video ports. Shows also the resolution of the incoming signal	
	0 (Disabled)	Video channel disabled
	1 (J2K)	Auto-selected
Frame Rate	Setting of the used frame rate, default is 25/30 fps depending on the video standard, in addition 50/60 fps are selectable.	
Last Frame on Signal Loss	Displays the last frame in case of signal loss. Otherwise a blue window is displayed instead.	
Standard	Displays the detected encoding algorithm: **J2K**.	

Deinterlace	*not applicable*
Noise Reduction	*not applicable*
Edit	Opens the **Stream Parameter Editor**, to configure STREAMING VIDEO CARD J2K, please see below!

Table 4-13
Video dialog box – STREAMING VIDEO CARD J2K

Configuring Streaming Video Card J2K

For each STREAMING VIDEO CARD J2K once the configuration parameters must be entered into the **Board Settings** dialog, therefore select **Board Settings** from the **Options** menu.

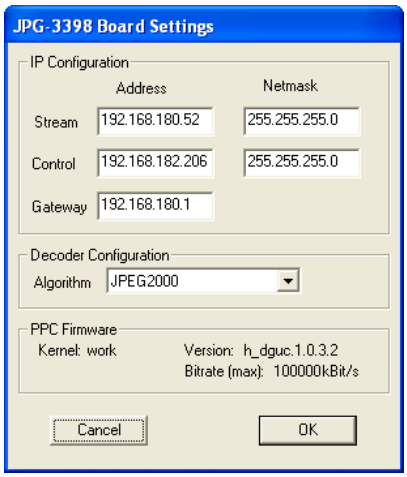


Figure 4-13
Board Settings dialog of the STREAMING VIDEO CARD J2K

The connectors of the video network (**Stream**) and the **Control** network must be configured for two different networks. This means the netmask must be identical for both interfaces and the network part of the two IP addresses must differ.

IP Configuration	
Stream	IP configuration of the video network interface
Address	IP address of the video network interface. Each video network interface of each STREAMING VIDEO CARD J2K needs its own, fixed IP address.
Netmask	Netmask of the video network interface.
Control	IP configuration of the control network interface
Address	IP address of the control network interface. Each control network interface of each STREAMING VIDEO CARD J2K needs its own, fixed IP address.
Netmask	Netmask of the control network interface.
Gateway	Gateway of the video network interface.
Decoder Configuration	
Algorithm	List of the supported decoder algorithms. Possible algorithm is: **JPEG2000**

Table 4-14

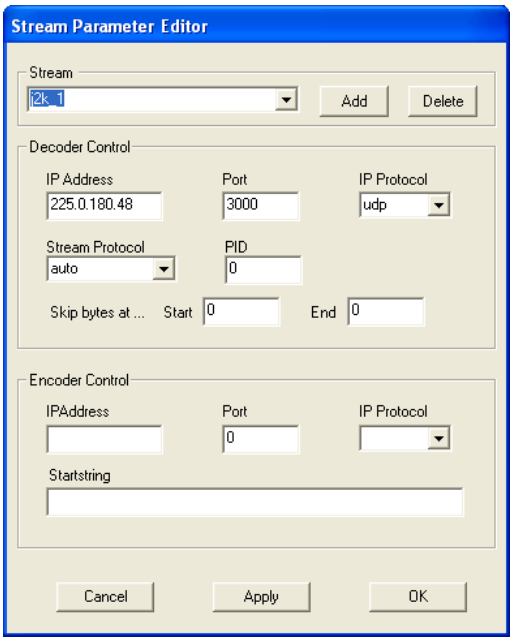
Configuring video streams

The parameters of a video stream must be defined in this **Stream Params Editor**, before the STREAMING VIDEO CARD can display it. Once defined it is available for every STREAMING VIDEO CARD in the system. To open the **Stream Params Editor** press **Edit** on the control panel.

Pressing the **Add** button adds a new stream with the entered name into the **Streams** list. The parameters that are displayed at that time are saved together with it. If an entry with the same name already exists its parameters are not changed. Pressing the **Apply** button applies the displayed parameters to the hardware. In that way

changes can be controlled directly. Pressing the **OK** button applies the parameters to the hardware and to the registry. Pressing the **Cancel** button closes the window, anyhow changes that are already confirmed with the **Add** or **Delete** button cannot be revoked.

Stream parameters for streams of Streaming Video Card SVC-1, SVC-2 and J2K are commonly stored and listed. If using different type of Streaming Video Cards in one system take care to select stream parameters that suite the card type!



Stream	A list of all video streams in alphabetic order. Stream names have to start with a letter; initial digits may not be used!
Decoder Control	
IP Address	the multicast IP address of the stream of the range: 224.0.0.0 to 239.255.255.255, 224.0.0.xxx is reserved for communication of network switches.
Port	Stream port, appendant to the IP address. 3000 is default
IP Protocol	Selection of the used IP protocol. RTP and UDP are selectable
Stream Protocol	*Not applicable, but the default value **auto** should not be changed.*
PID	*Not applicable, but the default value **0** should not be changed.*
Skip bytes at Start / End	*Not applicable, but the default value **0** should not be changed.*
Encoder Control	*Entries of this section are not applicable for the Streaming Video Card J2K*
Encoder Name	–
IP Address	–
Port	*0*
IP Protocol	–
Startstring	–

Figure 4-14
Parameters on the Streams Parameters Editor for STREAMING VIDEO CARD J2K

4.3.7 Displaying sources of Quad SDI Input Card

With a right click on the window of digital video the control panel for this type of video can be opened.

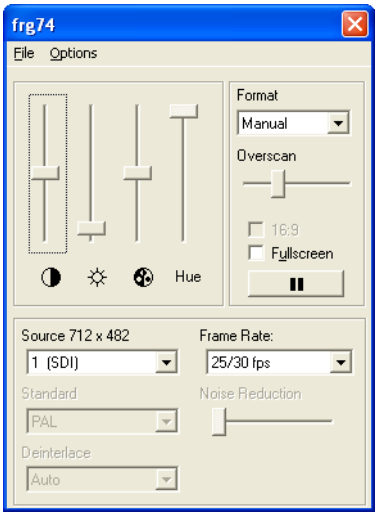


Figure 4-15
QUAD SDI VIDEO CARD – dialog box

	Setting of contrast	
	Setting of brightness	
	Setting of saturation	
Hue	*not applicable*	
Format	**Source**	Switch to native aspect ratio of source
	Display	Switch to native aspect ratio of projection module
	Manual	Resize x and y independently
Overscan	The edges of video often show disturbances; therefore an overscan of some % can be defined that will not be displayed. Values between 0% and 10% are possible Default: 3%	
16:9	Switch to 16:9 aspect ratio. Not applicable, if the Format **Manual** is selected.	
Fullscreen	Scale the video up to the whole display wall or in **Channel Video** mode to the projection cubes, which currently display a part of it.	
	Freeze / return to play (if the source is frozen, none of the displaying settings can be changed and the Scaler settings dialog cannot be opened)	
Source	Selection of the video ports. Shows also the resolution of the incoming signal	
	0 (Disabled)	Video channel disabled
	1 (SDI)	Enable SDI video signal
Frame Rate	Setting of the used frame rate, default is 25/30 fps depending on the video standard, in addition 50/60 fps are selectable.	
Standard	Displays the detected video standard. Possible standards: **PAL**, **NTSC**	
Noise Reduction	*not applicable*	
Deinterlace	*not applicable*	

Table 4-15
Video dialog box – QUAD SDI VIDEO CARD

4.3.8 Displaying sources of Dual DVI Input Card

With a right click on the window of digital video the control panel for this type of video can be opened.

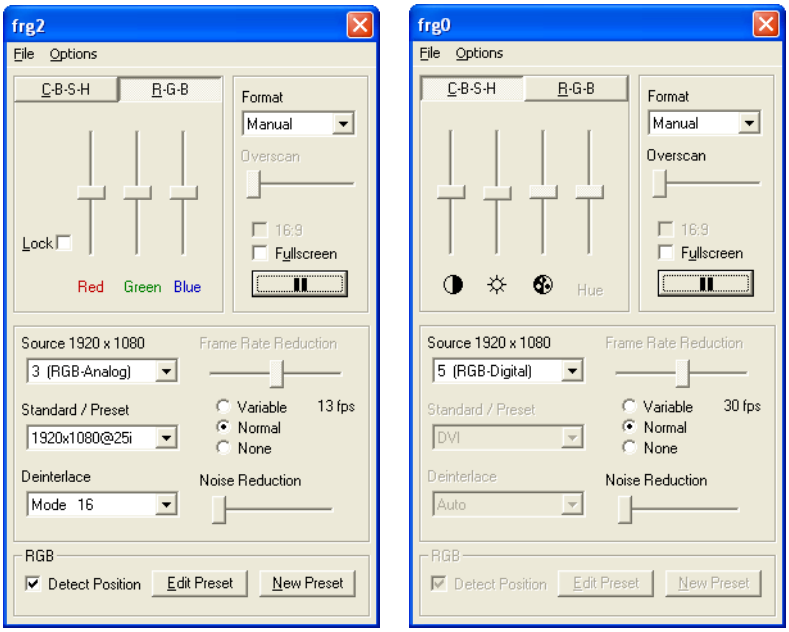


Figure 4-16
DUAL DVI INPUT CARD with source type analog RGB (left) and digital RGB (right) – dialog box

	Setting of contrast	
	Setting of brightness	
	Setting of saturation (only for source types **1**, **2**)	
Hue	Setting of hue (only for NTSC sources of type **1**, **2**)	
Lock	Red, green and blue are identically changed	
Red	Setting of red	
Green	Setting of green	
Blue	Setting of blue	
Format	**Source**	Switch to native aspect ratio of source
	Display	Switch to native aspect ratio of projection module
	Manual	Resize x and y independently
Overscan	The edges of video often show disturbances; therefore an overscan of some 3% can be defined that will not be displayed. Not applicable with source type 3, 4. Values between 0% and 10% are possible Default: 3% for video sources, 0% for digital RGB (DVI)	
16:9	Switch to 16:9 aspect ratio. Only effective for source types **1**, **2**, **4**; not applicable, if the Format **Manual** is selected.	
Fullscreen	Scale the video up to the whole display wall or in **Channel Video** mode to the projection cubes, which currently display a part of it.	
	Freeze / return to play (if the source is frozen, none of the displaying settings can be changed and the Scaler settings dialog cannot be opened)	
Source	Selection of the video ports. Shows also the resolution of the incoming signal	
	0 (Disabled)	Video channel disabled
	1 (Composite)	Enable composite video signal
	2 (S-Video)	Enable S-Video signal
	3 (RGB-Analog)	Enable analog RGB signal
	4 (YUV-Analog)	Enable component video signal
	5 (RGB-Digital)	Enable DVI-D signal

Standard / Preset	Displays the detected video standard for source types **1**, **2**, **5**	
	Selectable preset for source types **3**, **4**:	
	Auto	Enable automatic detection of the screen mode. (The detected screen mode is shown in the box, but automatic detection remains active unless a screen mode is selected by hand.)
	<screen modes>	One dedicated screen mode can be selected from the list, containing the screen modes stored in the active preset file. The screen mode will remain unchanged even if there is a signal with a different timing applied. (The names of the presets in the default preset file **rgb3010.prs** are combinations of resolution and refresh rate).
Deinterlace	Setting of de-interlacing mode for interlaced sources: (5 different modes are available. They should be selected depending on the content of the displayed video.)	
	Mode 12	PC mode
	Mode 13	film mode
	Mode 14	sport
	Mode 15	advanced
	Mode 16	auto-selection of one of the four modes above
Frame Rate Reduction	Setting of the dynamic reduction factor of the frame rate. The static frame rate reduction, which is determined by the input mode (please refer to section 4.1.6 Dual DVI Input Card) can additionally be reduced by this factor.	
	slider bar	Range from **0 .. 255** determines the dynamic reduction factor **f(x)=(256-x)/256**, **f(0) = 1** i.e. no further reduction **f(255) = 1/256** i.e. maximal reduction. The value **x** is shown when clicking on the slider, the resulting frame rate is displayed next to the Variable radio button.
	Variable	Slider bar is enabled
	Normal	Default
	None	Input frame rate is used, if possible
Noise Reduction	Noise reduction in the range of 0 to 16: slider in left position (0) – no noise reduction slider in right position (16) – maximum noise reduction Optimal noise reduction has to consider the content of the displayed source.	
Detect Position	Selectable for source types **3**, **4**: Detects automatically the visible portion of the signal and positions it in the video window. If selected this applies each time the signal changes or gets reconnected.	
Edit Preset	Selectable for source types **3**, **4**: Edit the preset.	
New Preset	Selectable for source types **3**, **4**: Create new preset.	

Table 4-16
Video dialog box – DUAL DVI INPUT CARD

If displaying sources of type **3 (RGB analog)** or type **4 (YUV-analog)**, please have a look at the following section 4.3.9 Displaying sources of Dual RGB Input Card to read more about the configuration of these source types.

EDID Prom and DDC

EDID data (Extended Display Identification Data) can be loaded to the DUAL DVI INPUT CARD to provide DDC data for the connected image source generator, e.g. the graphic card of a computer that is connected to an input of the DUAL DVI INPUT CARD.

By default the DUAL DVI INPUT CARD uses 1024x768@60Hz as DDC timing. To adapt the DDC timing, select the entry **Write EDID Prom** from the menu of the control panel (see section 4.3.3 Video software). The available EDID files are stored under the following path (`WINDOWS` could also be `WINNT` and the like):

```
c:\WINDOWS\system32\drivers\
```

The names of the EDID files each start with `Edid` followed by the timing they contain, e.g.:

```
Edid1024x768@60Hz.bin
```

In case that you want to check which EDID file is currently stored in the EDID prom, you can use the **Read EDID Prom** entry from the menu. The **Storing EDID data** dialog suggests the file name of the original EDID file as default name, as long as the original file still is in the folder given above. The suggested file name may serve to identify the timing.

4.3.9 Displaying sources of Dual RGB Input Card

With a right click on the window of an RGB source the control panel for RGB input can be opened.

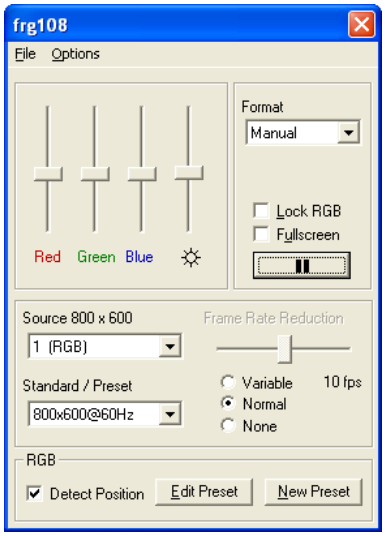


Figure 4-17
DUAL RGB INPUT CARD – dialog box

Red	Setting of red	
Green	Setting of green	
Blue	Setting of blue	
☼	Setting of brightness	
Format	**Source**	Switch to native aspect ratio of source
	Display	Switch to native aspect ratio of projection module
	Manual	Resize x and y independently
Lock RGB	Red, green and blue are identically changed	
Fullscreen	Scaling up of the video to the whole display wall or in **Display** mode to the projection modules, which currently display a part of it	
⏸	Freeze / return to play (if the source is frozen, none of the displaying settings can be changed and the Scaler settings dialog cannot be opened)	
Source	Selection of the video ports. Shows also the resolution of the incoming signal	
	1 (RGB)	Select a monitor signal
	0	The input is switched off. A blue window is displayed
Standard / Preset	**Auto**	Enable automatic detection of the screen mode. (The detected screen mode is shown in the box, but automatic detection remains active unless a screen mode is selected by hand.)
	<screen modes>	One dedicated screen mode can be selected from the list, containing the screen modes stored in the active preset file. The screen mode will remain unchanged even if there is applied a signal with a different timing. (The names of the presets in the default preset file **rgb3010.prs** are combinations of resolution and refresh rate).
Frame Rate Reduction	Setting of the reduction factor of the frame rate.	
	slider bar	Range from **0 .. 127**. determines the dynamic reduction factor **f(x)=(128-x)/128**, **f(0) = 1** i.e. no further reduction **f(127) = 1/128** i.e. maximal reduction. The value **x** is shown when clicking on the slider, the resulting frame rate is displayed next to the Variable radio button.
	Variable	Slider bar is enabled

	Normal	Default
	None	Input frame rate is used, if possible
Detect Position	Detects automatically the visible portion of the signal and positions it in the video window. If selected this applies each time the signal changes or gets reconnected. Only applicable with DUAL RGB INPUT CARD with controlware CTW-3010-02 or later.	
Edit Preset	Edit the preset.	
New Preset	Create new preset.	

Table 4-17
Video dialog box – DUAL RGB INPUT CARD

When starting to display an analog RGB-source or an analog YUV source the settings of the source are automatically detected as long as the default setting **Detect Position** remains on and **Auto** is selected in the **Presets** list. The DUAL RGB INPUT CARD and the DUAL DVI INPUT CARD perform complete auto detection of the screen mode as well as of the position. In most cases this results in settings to optimally display the RGB or YUV data. If anyhow auto detection sets a preset with e.g. a different resolution, then, if you know the timing of the incoming signal, select this timing from the preset list, the video software will position the source in respect of the newly selected timing.

Depending on the version of the controlware of the DUAL RGB INPUT CARD, auto detection might behave slightly different to the given description, which is based on version 3010-02. Please, refer in this case to section 4.3.10 Configuration of analog RGB and YUV input.

To check the version of the controlware you can use the device explorer, please refer to section 6.1.13 Device Explorer.

Preset editor

The **Preset Editor** allows the creation and adjustment of **presets**. Please, refer to section 4.3.10 Configuration of analog RGB and YUV input.

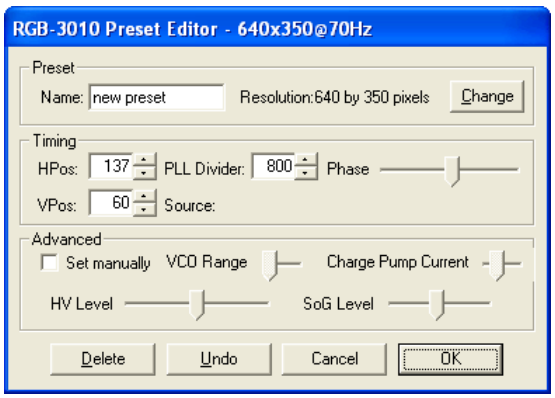


Figure 4-18
Preset Editor

Preset	
Name	Enter a name for a new preset
Change	Click this button to enter the correct resolution if the resolution shown differs from the resolution of your screen mode.
Timing	
HPos	The horizontal position of the monitor signal in relation to the window is adjusted
VPos	The vertical position of the monitor signal in relation to the window is adjusted
PLL Divider	The value represents the actual number of pixels per line
Phase	Adjustment of the phase
Advanced	
Set manually	Enables the automatic setting of the following parameters:
VCO Range	VCO Range
Charge Pump Current	Charge Pump Current
HV Level	Horizontal Vertical Sync Level
SoG Level	Sync on Green Level

Table 4-18

4.3.10 Configuration of analog RGB and YUV input

Analog RGB signals are digitized by the DUAL RGB INPUT CARD or the DUAL DVI INPUT CARD. Analog YUV signals are digitized by the DUAL DVI INPUT CARD. The software **video.exe** is pre-configured for displaying most common VESA-timings and HDTV timings. Please, refer to Table 7-14 and Table 7-15 for all pre-configured timings (presets).

For user specific timings the list of pre-configured timings can be customized, extended and stored in a user defined preset file xxx.prs, as described below.

Setting up a test pattern

For configuring the DUAL RGB INPUT CARD or DUAL DVI INPUT CARD for analog RGB or YUV input it is useful to have a suitable test pattern, basically thin black and white vertical lines:

Windows 95/98, Windows NT/2000/XP, Macintosh, PowerMacintosh	Close applications and switch desktop pattern to alternating, one pixel wide, black and white vertical lines.
Sun Workstation	In console window (**`cmdtool`**) enter **`xsetroot -mod 4 4`**, (enter **`xsetroot -mod 4 4`** for removing the pattern again).
Others	Display text, which contains many **HHHHHHH**.

Table 4-19

Adjusting the preset

- Set up a suitable test pattern on the connected computer.
- Start the **video** software.
- Make sure that the signal is displayed in standard size and ratio by pressing the **F8** key on the keyboard of the PROCESSOR.
- In the **Input** list of the **video** dialog box click **1 (RGB)**.
- In the **Preset** list click **Auto**.

A preset is applied automatically. The name of this preset is shown in the **Preset** box.

- Check the displayed monitor signal. If it is displayed in proper quality the configuration of the DUAL RGB INPUT CARD is finished.
- If the image is displayed jerkily, increasing the value for **Reduction** can solve this.

If the monitor signal is not yet displayed in proper quality you have to adjust the pre-configured timing.

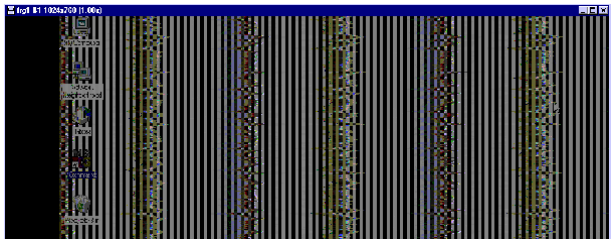


Figure 4-19
Automatically selected preset has to be adjusted

If the displayed monitor signal looks like this or similar, select **Edit** to adjust this preset or select **New** to create a new preset based on the current preset. The **Preset Editor** is displayed:

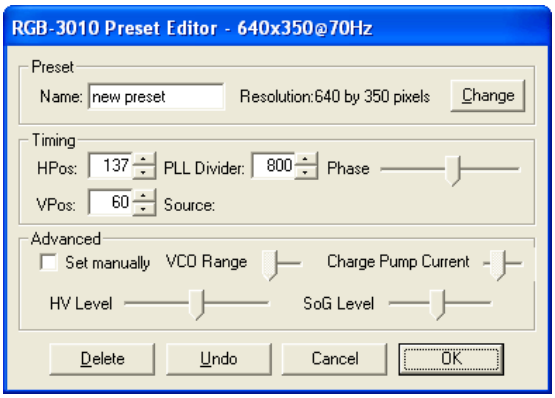


Figure 4-20
Preset Editor

- For a new preset enter a name in the **Name** box under **Preset**.
- Compare the displayed resolution with the actual resolution of the connected monitor signal. If they differ, click **Change** and enter the correct resolution

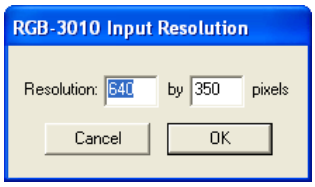


Figure 4-21
Indicating the resolution

The most important parameter to be adjusted is the **PLL Divider**: Observe the outline of characters, color transitions or the grid desktop background! If there is interference visible, the value of the **PLL Divider** has to be adjusted.

- The value of the **PLL Divider** is approximately 1.3 times the horizontal resolution. In the **PLL Divider** box, type in or click the arrows to select this value. Usually it will be necessary to increase this value slightly to remove all interfering stripes. The direction of the adjustment is correct as the number of vertical stripes decreases.
- Check the position of the displayed monitor signal in relation to the window borders. To move it to the left, increase the value of **Hpos**. To adjust the vertical position, change the value of **Vpos.**
- If necessary tune **Phase** until the test pattern is displayed without flicker.
- With the settings under **Advanced** it can be tried to further improve the picture quality.
  If using e.g. a QUAD SPLITTER 350 horizontal and vertical lines may appear as wavy lines; a reduction of the value of the **HV Level** will resolve this.

With an optimized preset the result looks like this:

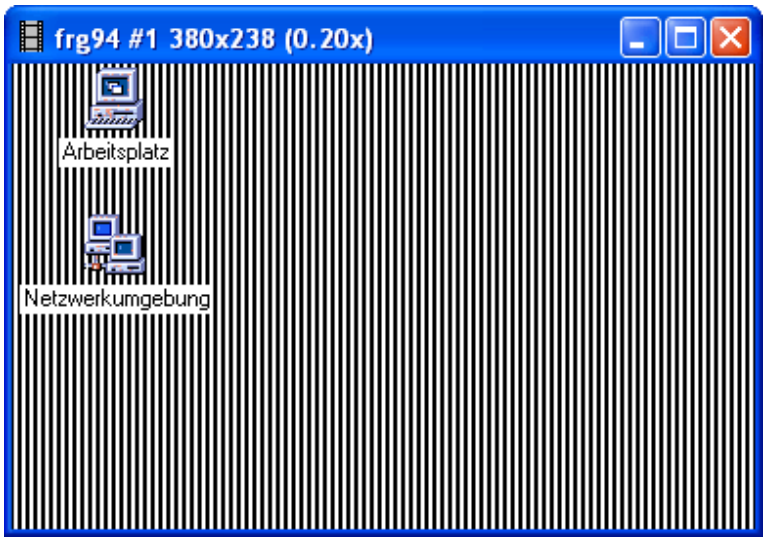


Figure 4-22
Optimized preset

Now you can change the desktop to a colorful application and adjust the **settings** by means of the **video** dialog box (**Red**, **Green**, **Blue**, **Brightness** and so on).

Managing preset files

The pre-configured timings as well as additional user defined timings are stored as presets in preset files. When using the DUAL RGB INPUT CARD or Dual DVI Input Card the default preset file **rgb3010.prs** is applied.

The file **rgb3010.prs** contains the default presets for the DUAL RGB INPUT CARD and the DUAL DVI INPUT CARD. When taking a card for the first time into operation, the presets contained in this file will be written to the registry. The registry is the location where the active presets are stored.

With a new release of the display driver there might also come an updated default preset file. This file replaces the former default preset file but these presets are not automatically stored as active presets to prevent your own customized active presets from being overwritten. Instead, please use the Import/Export filter as explained below to import additional useful presets within your active presets.

From the **File** menu choose **Import/Export Presets ...** to manage the presets:

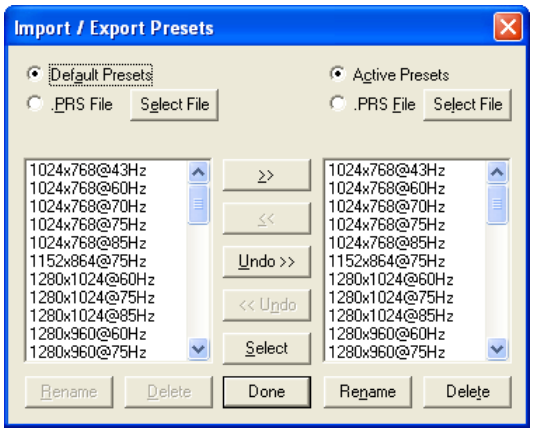


Figure 4-23
Managing presets

Default Presets	The file **rgb3010.prs** is provided together with the display driver and is identical to the **Active Presets** when using the input card for the first time. This file cannot be changed.
Active Presets	A new preset is stored in the **Active Presets**. The **Active Presets** are stored in the registry. All modifications of a preset are instantly executed and stored without any **Save** command. These presets will also be available after restarting TRANSFORM A.
.PRS File	A .prs file is a user defined preset file which can be imported and exported. Click **Select File** to specify the desired preset file.

Table 4-20

When storing a new preset file, it is written as read-only file. Before you can change its contents, you will need to remove the read-only attribute within the file properties dialog.

In a file manager, press the right mouse button on the file name, select **Properties** and make sure that **read-only** is not selected. Click **Apply**.

Presets can be added to or removed from the **Active Presets** as well as from a selected preset file. They can be exchanged from left to right (**>>**) and vice versa (**<<**). To select the presets click them with the mouse. Pressing **Shift** while clicking enables one to select several presets. Pressing **Contr** while clicking toggles the selection state of the clicked preset.

The **Select** button offers access to the dialog box **Select Presets**:

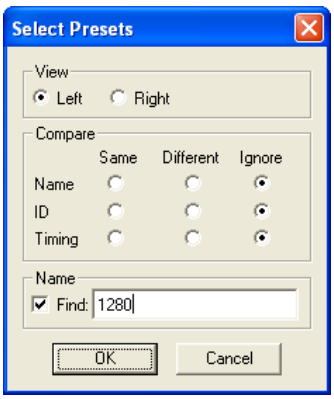


Figure 4-24
Selecting presets

View	
Left	presets from the left column will be selected
Right	presets from the right column will be selected
Compare	compares **Name**, **ID** and **Timing** of left and right column presets
Same	presets with identical Name, ID or Timing will be selected
Different	presets with different Name, ID or Timing will be selected
Ignore	the category will not be taken into account
Name	
Find	selects the presets whose name contains the inserted character string (capitalization and small initial letters are taken into account)

Table 4-21

No presets can be added to or removed from the Default Presets rgb3010.prs.

Managing the configuration files

When displaying a monitor signal, settings such as colors and brightness can be adjusted. In addition, attributes of the video window can be customized. These properties, which are valid, independent of the signal's source are called **Settings** and can be saved in a configuration file (e. g. **default.frg4.vcf)** and re-loaded.

From the **File** menu choose **Open Settings** to load a certain configuration file; choose **Save Settings** or **Save Settings As ...** to store your settings.

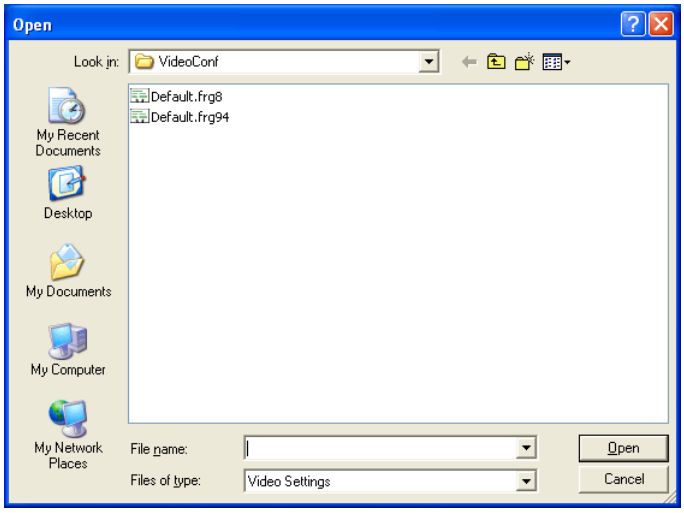


Figure 4-25
Managing configuration files

The **video** software can also be started from the command line with the option **/c:** specifying a certain configuration file. Please, refer to section 4.3.1 Display in a window.

If using the option /c:, take care to indicate the complete absolute or relative path of the configuration file!

5 Maintenance

The devices of TRANSFORM A require very little maintenance. Some maintenance operations are nevertheless necessary to maintain distortion free operation of TRANSFORM A and can be done by means of the following descriptions.

WARNING

Maintenance operations not explained in this section bear the risk of electric shock and of injury from hazardous moving parts!

If a maintenance operation is needed that is not mentioned in this chapter, instruct authorized personnel with it!

5.1 Exchange of consumables

5.1.1 Replacing the filter pad of Processor

The filter pad of the PROCESSOR has to be changed in intervals, depending on the grade of pollution of the air. The air filter is located behind the ventilation slits [1] on the front of the PROCESSOR; please refer to Figure 3-1 front view of the Processor.

- Unlock the front cover of the PROCESSOR with the key!
- Pull the handle of the filter mounting [2] into your direction!
- Pull out the filter mounting to the right!
- Remove the old filter pad!
- Insert a new filter pad!
- Insert the mounting into the PROCESSOR until the handle engages!
- Lock the front cover!

As long as the filter pad is not irreversibly blocked, cleaning it with a vacuum cleaner is also an acceptable method to maintain good air ventilation within the system!

5.1.2 Replacing the filter pad of OmniBus A12 and Extender

The filter pads of OMNIBUS A12 and EXTENDER devices have to be changed in intervals, depending on the grade of pollution of the air. The air filter is located behind the *ventilation slits* [1] on the front of the device; please refer to Figure 3-7 Front view of OmniBus A12 and Figure 3-13 Front view of the Extender respectively.

- Unlock the ventilation flap by turning its *lock* [2] with the key and open it!
- Remove the old filter pad!
- Insert a new filter pad!
- Turn the ventilation flap upwardly and close it by turning the *lock* [2]!

As long as the filter pad is not irreversibly blocked, cleaning it with a vacuum cleaner is also an acceptable method to maintain good air ventilation within the system!

5.1.3 Replacing a power module of OmniBus A12

The OMNIBUS A12 with redundant, hot-plug power modules can be connected to three independent power nets. If one of the three power modules or a power net is failing, you can hear a buzzer alarm that can be reset by pushing the red *buzzer reset* button [5] at the front of the OMNIBUS A12, please refer to Figure 3-7 Front view of OmniBus A12. Also the LED *standby / component failed* [6] at the front starts blinking. This LED remains blinking as long as the failure persists even if the *buzzer reset* button has been pressed.

23	air supply
24	mains connection
25	LED: power status
27	unlock-handle-bar
28	handle

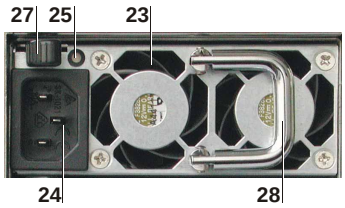


Figure 5-1
Power module on the rear of OMNIBUS A 12

The defective power module or the failing power net can be located by examining the individual LED's *power status* [25] on the back of the device, see above. If the LED of one power module is off or lightens red while the LED's of the other two power modules lightens green, then the power module with the non-green LED is either defective and must be re-placed or the power net connected to it has failed.

Exchange of a redundant power module

Take care NOT to remove a power module from the device unless you unplugged its power cord.

Never touch the contacts on the backside of a power module. There is the danger of being harmed by residual voltage! Furthermore the operation of the power module might be impacted by impurities!

Use gloves to remove the power module. The cover of the power module is been used as heat sink for cooling, usually the temperature is around 50 – 60° Celsius under full condition!

When exchanging a power module during operation of the OmniBus A12, the two other power modules have to be in operation.

- Locate the defective power module by examining the *LED's* [25] on the individual power modules, please see above.
- Unplug the power cord from the *mains connection* [24] of the concerned power module!
- Push the *unlock-handle-bar* [27] to the right unless the power module is released, keep it at the right and remove the defective power module by pulling at the *handle* [28]!
- Take a new power module and insert it into the system. Take care to insert it in the same orientation like the other modules with the *mains connection* [24] on the left side!
- Make sure that the *unlock-handle-bar* [27] engages!
- Re-plug the power cord into the *mains connection* [24]!
- Check that the *LED* [25] lightens up green!
- Check that the red LED *standby / component failed* [6] at the front of the OMNIBUS A12 stops to shine!
  Please note: As soon as the defective power module is removed and the remaining two power modules are working well, this LED will also stop to shine. It only indicates if a defective component is in the device.

5.2 Cleaning

Use a soft cloth to periodically clean the cabinet. Stubborn stains may be removed with a cloth lightly dampened with mild detergent solution. Never use strong solvents, such as thinner or benzine, or abrasive cleaners, since these will damage the cabinet.

Unplug the device from the wall outlet before cleaning.

Never clean the case of a TransForm A device without first disconnecting all power supply cords!

Do not use liquid cleaners or aerosol cleaners!

6 Advanced configuration

This chapter provides help for reconfiguring the software of your TRANSFORM A.

6.1 Advanced software configuration

The display driver of your TRANSFORM A can be configured as described in section 3.5.2 Configuring the display driver and 3.5.3 Configuring the display wall.

Some advanced features are not accessible from the control panel. They can be configured directly in the Windows registry.

6.1.1 Editing the registry

Registry editor

Click the **Start** button on the taskbar and choose **Run ...** to display the **Run** dialog box:

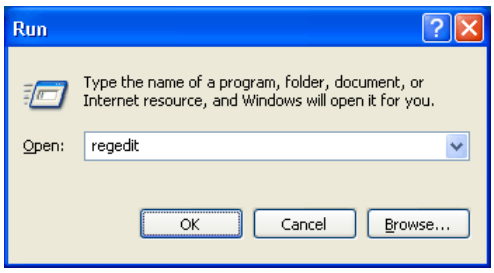


Figure 6-1
Run regedit

Enter **`regedit`** as the program to be opened and click **OK**. The **Registry Editor** is started. Follow the path:

```
HKEY_LOCAL_MACHINE
 \System
  \CurrentControlSet
   \Services
    \agx3281
     \Device0
```

Open the desired entry by double-clicking its name in the list. If it does not exist yet create an entry with the commands **Edit** and **New**.

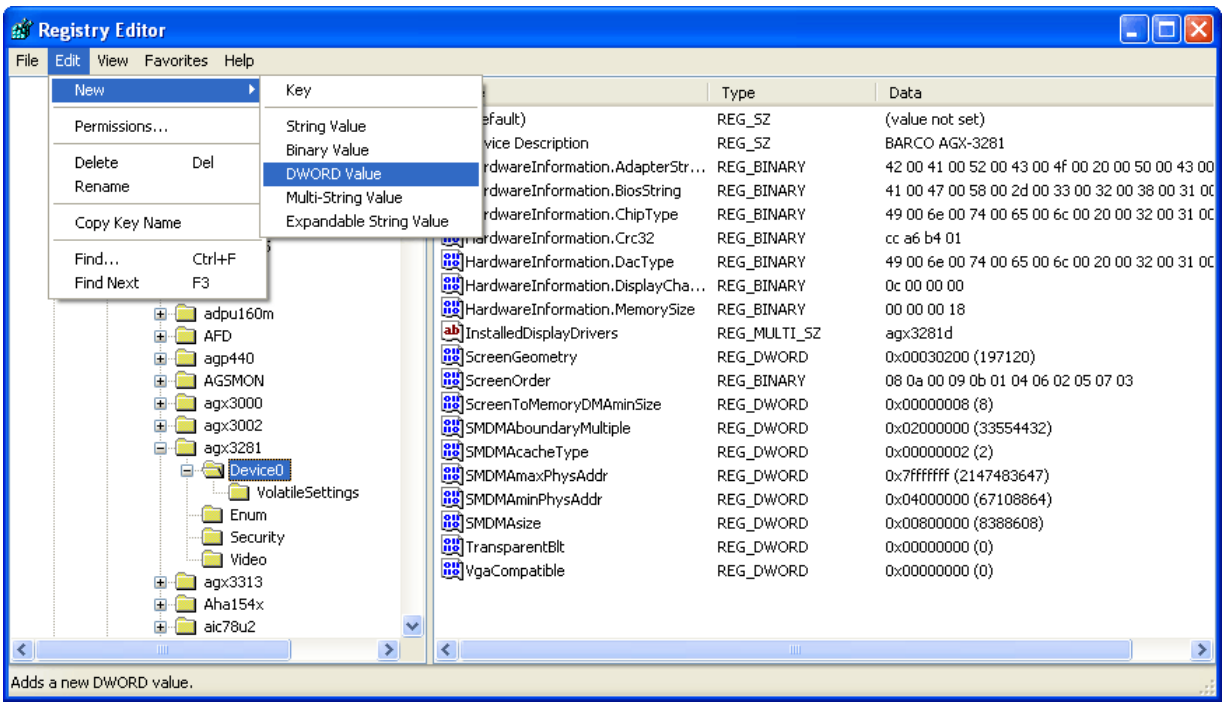


Figure 6-2
Create a new entry in the registry

In the **Edit DWORD Value** dialog box, e. g., you can edit **Value data** and specify if the value's base is hexadecimal or decimal.

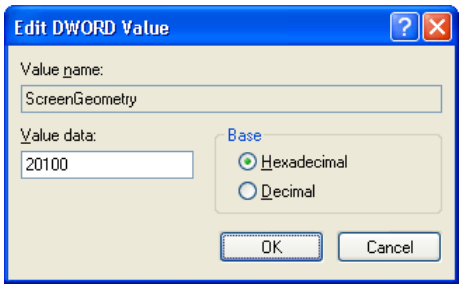


Figure 6-3
Editing an entry in the registry

Click **OK** and exit the registry editor unless you want to make further changes to the registry. Unless indicated otherwise all changes will take effect after rebooting.

6.1.2 Registry reference

ScreenGeometry

The `ScreenGeometry` value determines the arrangement of the connected Barco projection cubes, projectors or monitors.

Name	`ScreenGeometry`
Typ	DWORD
Value	`XXYY00` hex, XX = 0..FF, YY = 0..FF
Default	0
Effective	after rebooting

Table 6-1

The leading **`0x`** declares the number to be hexadecimal, the following digits are divided in three groups: **`<(XXX)X> <YY> <..>`**. The first group determines the number of modules in horizontal direction **`X`**, the second one gives the number in vertical direction **`Y`**, the third has to be **`00`**. Only the number of modules exceeding a 1×1 arrangement is taken into account. Thus an arrangement of 3×2 modules (3 rows, 2 lines) is written as: **`00020100`**. The leading zeroes however are skipped: **`20100`**.

The following table lists examples for some arrangements:

lines	**rows**				
	1	**2**	**3**	**4**	**...**
1	**00000**	**10000**	**20000**	**30000**	
2	**00100**	**10100**	**20100**	**30100**	
3	**00200**	**10200**	**20200**	**30200**	
4	**00300**	**10300**	**20300**	**30300**	
...					**...**

table 6-2

ScreenOrder

The order in which the Barco projection cubes, projectors or monitors are assigned to the graphic channels of TRANSFORM A, is stored as `ScreenOrder` in the registry.

Name	`ScreenOrder`
Typ	Binary Value
Value	binary string with up to 256 bytes
Default	`000102..FF`
Effective	after setting display properties or after rebooting

Table 6-3

The `ScreenOrder` value data are divided in pairs: **<AA><BB><CC><DD>...**. The first pair specifies which channel is assigned to the first projection cube, the second pair specifies which channel is assigned to the second projection cube and so on. The projection cubes are counted starting with zero.

As default the Barco projection cubes and graphic channels are assigned in columns from top to bottom starting with the left column as shown in Figure 3-63. This assignment may be changed for some reason. E. g., it may be advantageous to change the order thus, that the channels are assigned in rows instead of columns as shown in Figure 3-64. The following table lists some examples:

arrangement x×y	Assigning cubes and channels in columns	Assigning cubes and channels in rows
4×1	**00010203**	**00010203**
2×2	**00010203**	**00020103**
3×2	**000102030405**	**000301040205**
2×3	**000102030405**	**000204010305**
4×2	**0001020304050607**	**0004010502060307**

Table 6-4

Please, refer to section 3.5.3 Configuring the display wall for more details.

MappingCache

The amount of memory available for PCI mapping cache is stored in the `MappingCache` in the registry.

Name	`MappingCache`
Typ	DWORD
Values	`4..64`
Default	64
Effective	after rebooting

Table 6-5

The value is specified in Megabytes. Each UGX or AGX GRAPHIC CARD requires 16 KB non-shared system space and 16 MB shareable system space. The shareable 16 MB are made visible to the CPU through the mapping windows reserved as specified by the MappingCache registry setting.

If other drivers need a lot of system pages or if they are forced to do so by applications there are two possibilities to make the necessary space available.

On the one hand you can change the set value for the system pages to a sufficient large value. The system pages entry can be found in the registry under the following path:

```
HKEY-LOCAL-MACHINE
 \System
  \CurrentControlSet
   \Control
    \Session Manager
     \Memory Management
      \SystemPages
```

The table below list depending on the operation system the amount of a sufficiently large value for the system pages.

Operating System	System Pages	Size in MB
Windows 2000	**50000**	**195**
Windows XP	**110000**	**429**

Table 6-6

On the other hand you can decrease the value for the MappingCache. This can lead to a small loss of performance for some graphic operations.

SynchronizeEngine

With the `SynchronizeEngine` entry in the registry the graphic performance can be increased accepting a longer interrupt time.

Name	SynchronizeEngine
Typ	DWORD
Value	`0` or `1`
Default	0
Effective	after rebooting

Table 6-7

Please, refer to section 3.5.2 Configuring the display driver for more details (**Synchronize with graphics engine**).

UseDeviceBitmaps

Whether device bitmaps (off-screen video memory) are used or not is stored as `UseDeviceBitmaps` in the registry.

Name	`UseDeviceBitmaps`
Typ	DWORD
Value	`0, 1` or `800000..B000000` hex (8..176MB)
Default	`1`
Effective	after rebooting

Table 6-8

Please, refer to section 3.5.2 Configuring the display driver for more details (**Use device bitmaps**).

If the use of device bitmaps is activated, the display driver attempts to store the bitmaps in the physical memory of the graphic cards. If this memory is not sufficient, system memory is used beyond (Paged Pool), which could lead to conflicts with system processes. The paged pool is managed by Windows and only released to a specific amount. It is advisable to increase, this storage space from 0MB (dynamic management) to the maximum 192MB (`C000000` hex). This is set in the registry editor under the following path:

```
HKEY-LOCAL-MACHINE
 \System
  \CurrentControlSet
   \Control
    \Session Manager
     \Memory Management
      \PagedPoolSize
```

You can find a detailed description for calculating the paged pool size in:

- **Microsoft Knowledge Base**, Article ID: Q126402

By default the display driver of TransForm A will leave at least 16MB of paged pool space for other applications on systems with 32MB RAM or more. By setting the UseDeviceBitmaps registry entry to a value between 800000 and B000000 hex (8..176MB), the paged pool usage for device bitmaps can be even further limited. It is recommended to make use of this possibility only if applications and/or other drivers running on the machine need a combined amount of paged pool space larger than 16MB.

Orbiting

With the `Orbiting` entry in the registry orbiting of the display can be started and the orbiting time can be defined.

Name	`Orbiting`
Typ	DWORD
Value	`0..FFFFFFFF` hex
Default	0
Effective	after one revolution or, starting from `0`, after rebooting

Table 6-9

Please, refer to section 3.5.2 Configuring the display driver for more details (**Orbiting**).

PanelResolutionOnly

With the `PanelResolutionOnly` entry is determined if the AGX GRAPHIC CARD can only be operated with the native resolution of the display device or if it could also be operated in a lower resolution. This setting applies to digital displays only.

Name	`PanelResolutionOnly`
Typ	DWORD
Value	`0` or `1`
Default	0
Effective	after rebooting

Table 6-10

If value is set to 1 only the native resolution can be selected in the display properties dialog. This is also the case, if the OMNISCALER is used together with the graphic card. If value is 0, also lower resolution can be selected.

This option has no effect on the display properties of the UGX GRAPHIC CARD. It always uses the value 1 irrespective of the selected value.

TransparentBlt

This option has no effect on the display properties of TRANSFORM A.

WriteCombining

With the `WriteCombining` entry in the registry write combining can be enabled on CPUs with Pentium Pro, Pentium II, Pentium III, Pentium IV or Celeron processor.

Name	`WriteCombining`
Typ	DWORD
Value	`0` or `1`
Default	1
Effective	after rebooting

Table 6-11

Write combining enables the CPU to transfer images to the graphical boards faster but may cause rendering errors under rare conditions.

Coring

With the `Coring` entry in the registry the threshold of Coring is defined.

Name	`Coring`
Typ	DWORD
Value	`0..FF` hex
Default	0
Effective	after setting display properties or after rebooting

Table 6-12

With activated `Coring` all RGB values in the hardware color table up to the defined black value are cut off.

Setting Coring to 10 hex may reduce noise in the video display and increase contrast. This setting effects only color depth of 15, 16 or 32 bit of the UGX or AGX GRAPHIC CARD.

RedGamma, GreenGamma, BlueGamma

With the `RedGamma, GreenGamma` or `BlueGamma` entry in the registry each color channel of the video signal can be adapted to the monitor or projector color display properties. Thus colors and contrast can be displayed optimally.

Names	`RedGamma, GreenGamma, BlueGamma`
Typ	DWORD
Value	`0..65535` dec
Default	0
Effective	after setting display properties or after rebooting

Table 6-13

This functionality becomes only effective, if all three variables have nonzero values. A gamma of 1.0 is represented by the decimal value 10000 (e.g. 2.2 is encoded as 22000).

GrayScale

With the `GrayScale` entry in the registry a single 8 bpp format can be selected.

Name	`GreyScale`
Typ	DWORD
Value	`0` or `1`
Default	0
Effective	after rebooting

Table 6-14

Set to 1, the display driver offers a single 8 bpp format with a fixed palette containing up to 256 shades of gray (linear or gamma corrected).

SharedSection

The entry `SubSystems` which contains the value `Windows` with `SharedSection` is found on the following path:

```
HKEY_LOCAL_MACHINE
 \System
  \CurrentControlSet
   \Control
    \Session Manager
     \SubSystems
```

With `Windows/SharedSection` the amount of memory used for desktop heap can be adjusted.

Name	`Windows`
Typ	REG_EXPAND_SZ
Value	… `SharedSection=XXXX,6144,ZZZ` … dec
Default	`3072 / 6144`
Effective	after rebooting

Table 6-15

TRANSFORM A systems are delivered with this value increased to 6144 to support larger numbers of windows. Windows XP standard value is 3072.

The complete expression of `Windows` looks like this or similar:

```
%SystemRoot%\system32\csrss.exe ObjectDirectory=\Windows
SharedSection=1024,6144,512 Windows=On SubSystemType=Windows
ServerDll=basesrv,1 ServerDll=winsrv:UserServerDllInitialization,3
ServerDll=winsrv:ConServerDllInitialization,2 ProfileControl=Off
MaxRequestThreads=16
```

6.1.3 Configuring video

With the switcher definition file user defined names can be assigned to the input, a video switcher can be integrated into the system and be controlled, distributed video can be configured and a video switcher can be used by multiple computers simultaneously.

Therefore information about the video hardware configuration (i.e. input cards, cabling, switchers, computers, etc.) needs to be specified in the switcher definition file and compiled into the registry with the switcher language compiler.

If the switcher language compiler is already installed the needed files can be found in the folder: **C:\Program Files\BARCO\SLC** or if not installed to the default folder in the folder indicated during the installation process. Else the switcher language compiler has to be installed, please refer to section 3.5.1 Installing the display driver and switcher language compiler!

A simple switcher definition file **example.vsw** is included. It can be adapted to your specific configuration and the name of the file can be changed. The file **slc.exe** is the compiler that reads the indicated switcher definition file and inserts the entries into the registry. The other files contain static hardware information and may not be changed.

The switcher definition file

The switcher definition file contains all individual parameters of the related hardware configuration: computers, video switcher, configuration of STREAMING VIDEO CARDS, definition of analog sources, routing of the analog sources to the input devices and the cabling.

Line comments are marked with `//` at the beginning of a line, enclosed comments start with `/*` and end with `*/`. To refer to the different hardware components the hardware identifiers that are listed in the table below are used. The numbering in square brackets `[x]` appended to the hardware identifier distinguishes between multiple hardware instances of the same type. Numbering always starts for all assets except of video switcher subdevices with `[0]`. With video switchers one number is used per video switcher device. For the input cards each channel available on the card is numbered, this means for each DUAL DVI INPUT CARD or DUAL RGB INPUT CARD two channels are considered and four channels for each QUAD ANALOG VIDEO CARD, QUAD SDI VIDEO CARD and STREAMING VIDEO CARD, irrespective if there are signals connected to the channels or not. When referring to the card itself one number per card is used, this is only applicable for the different types of STREAMING VIDEO CARDS, e.g **mpg3012[0]** for the first STREAMING VIDEO CARD. The cards/input channels are numbered subsequently corresponding to their order in the PCI slots, see section 3.2.15 OmniBus and section 3.2.16 Extender respectively.

vsw2974[x]	Video Switcher (Valid for models AutoPatch 1YDM, AutoPatch 1Y-16, AutoPatch 4YDM)
frg3008[x]	input channels of QUAD ANALOG VIDEO CARD, STREAMING VIDEO CARD, QUAD SDI VIDEO CARD, DUAL DVI INPUT CARD and DUAL RGB INPUT CARD; input channels of these card types are commonly considered
mpg3012[x]	STREAMING VIDEO CARD (for configuration of the board settings, see **Board** section)

Table 6-16
indication of input cards

The switcher definition file contains multiple sections with the configuration information:

- **Switcher**
  Definition of the video switcher hardware, connection settings, number of input and output channels of the switcher and data format
- **Computer**
  Definition of the computer by IP address or name. This is required in case of multiple TRANSFORM A systems using the same video switcher.
- **Board**
  Configuration parameters of the STREAMING VIDEO CARDS. Configuration can also be done with the software **video.exe**, please refer to sections 4.3.5 Displaying sources of Streaming Video Card SVC-1 and SVC-2 and 4.3.6 Displaying sources of Streaming Video Card J2K.

- **Grabber**
  Assigning individual names to the video-/RGB-channels of the input cards.
- **DFRG**
  One or multiple **Grabber**s get a name as video channel.
- **Sourcelist**
  for each analog video- and RGB source a name and the type of the signal must be defined. These sources are grouped in one or multiple sourcelists.
- **Routes**
  Here it is determined which **Sourcelist** shall be available for which video/RGB channels.
- **Cables**
  This section describes the cabling of each analog video or RGB source through the video switcher to the ports of the input on the cards.

These sections are explained by means of an example. It covers two display walls; one wall is controlled by a TransForm A consisting of a Processor with two OmniBus devices whereas the other TransForm A consists of a Processor with just one OmniBus. Analog Video- and RGB sources are provided from a video switcher. Streaming video is provided by the video LAN over IP. Processor 1 functions as server which means it controls the video switcher via serial connection. Processor 2 is connected to Processor 1 via the LAN. The outputs of the video switcher are divided into two logical sub-devices; one is for the RGB output, the other for the analog video output. For each of the sub-devices a port on the server is defined.

In the OmniBus 1 of Processor 1 there is one Quad Analog Video Card, one Streaming Video Card and one Dual RGB Input Card. In the OmniBus 2 there is another Quad Analog Video Card and Streaming Video Card. Two distributed videos are configured, see also section 4.2.8 Distributed video. One distributed video is built with the first channel of the Quad Analog Video Cards, the other one with the first channel of the Streaming Video Cards.

Processor 2 with its OmniBus 1 contains just one Quad Analog Video Card and one Dual RGB Input Card.

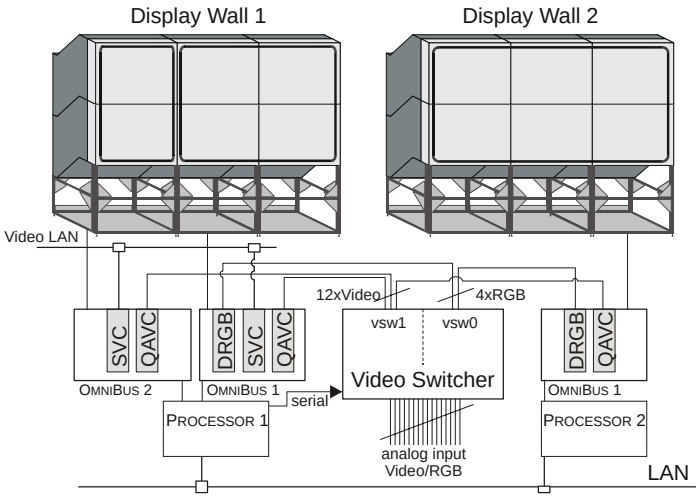


Figure 6-4
Example configuration, using video switcher, multiple computers and distributed video

Switcher

Each section beginning with **Switcher** defines a logical video switcher device. In order to specify the type of signal to be switched, select one of the following keywords as **videotype**: **composite, svideo, rgb, rgbc, rgbhv**. Data with need of fewer channels may as well be transmitted; if for example **rgbhv** is selected as well data of type **rgb** and **rgbc** may be transmitted.

Video switchers can be divided into a master- and a sub-device; i.e. the inputs are affiliated to the master device, the outputs are divided in multiple logical video switchers. This enables the use of one physical video switcher for video- as well as RGB-sources or just in order to provide a clearer logical structure to the distributed signals.

Switcher	The name inserted in quotes is the user accessible name.
Device	Name of the video switcher, see Table 6-16 and text above, please! Sub-devices are numbered with an appended index, starting with [1] counted up successively if more sub-devices are used.
Connection	Determines the serial port of the server.
Inputs	Determines the number of available inputs of the video switcher. Needs to be indicated for the master device. Sub-devices use the inputs of the master device.
Outputs	Determines the number of available outputs of the master- or sub-device.
Level	Reserved for advanced configuration.
Videotype	Determines which type of signal may be transmitted by the outputs. Select **composite, svideo, rgb, rgbc, rgbhv, dvi_rgba** (Dual DVI Input Card port 3)**, dvi_yuva** (Dual DVI Input Card port 4) or **dvi_rgbd** (Dual DVI Input Card port 5).
Host	Indicates the computer, connected via the serial interface, with its user accessible name as defined in section **computer.** Only used with multiple computers!
Port	Port number at the server to connect to video switcher. Master- and sub-devices need separate port numbers. Only used with multiple computers!
RemoteType	Reserved for advanced configuration.

Table 6-17

```
Switcher "vsw0"
{
    Device        = vsw2974[0];
    Connection    = com2;
    Inputs        = 4;
    Outputs       = 4;
    Videotype     = rgbhv;
    Host          = server;
    Port          = 4999;
}

Switcher "vsw1"
{
    Device        = vsw2974[0][1];
    Outputs       = 12;
    Videotype     = svideo;
    Port          = 5000;
}
```

Computer

Each section beginning with **Computer** defines the name and optionally the IP address of every PROCESSOR that will control the switcher.

Computer	The name inserted in quotes is the user-defined name.
Name	Name of the computer in the domain.
IPAdress	Optional, if the IP address is indicated it is taken to identify the computer instead of **Name**.

Table 6-18

```
Computer "server"
{
    Name          = processor-1;
    IPAddress     = 150.158.181.149;
}

Computer "processor-2"
{
    Name          = processor-2;
}
```

Board

For each STREAMING VIDEO CARD in the system the settings can be defined in a **Board** section. (Alternatively they can be configured with the software **video.exe**, please refer to section 4.3.5 Displaying sources of Streaming Video Card SVC-1 and SVC-2 and 4.3.6 Displaying sources of Streaming Video Card J2K.

Board	Indication of the STREAMING VIDEO CARD, see Table 6-16, please! The number in brackets is the number of the STREAMING VIDEO CARD in the PCI slots order starting with [0] counting up successively if more STREAMING VIDEO CARDS are used.
ipaddress	The IP address of the STREAMING VIDEO CARD. This must be one unique, fixed IP address for each STREAMING VIDEO CARD.
ipnetmask	The netmask of the STREAMING VIDEO CARD. Must be the same for each STREAMING VIDEO CARD.
ipgateway	The gateway of the STREAMING VIDEO CARD. Must be the same for each STREAMING VIDEO CARD.
codec	The coding algorithm; the following algorithms are supported: • **h263**, **mjpeg**, **mpeg2**, **mpeg4_sp**, **scn_dec**, **visiowave** for STREAMING VIDEO CARD SVC-1 • not applicable for STREAMING VIDEO CARD SVC-2, adjust the stream settings in video.exe instead. • **j2k** for STREAMING VIDEO CARD J2K

Table 6-19

```
Board mpg3012[0]
{
    ipaddress="192.168.0.176";
    ipnetmask="255.255.255.0";
    ipgateway="192.168.0.1";
    codec="mpeg2";
}
Board mpg3012[1]
{
    ipaddress="192.168.0.177";
    ipnetmask="255.255.255.0";
    ipgateway="192.168.0.1";
    codec="mpeg2";
}
```

Grabber

Each section beginning with **Grabber** assigns a user accessible name to a single channel of an input card.

Grabber	The name inserted in quotes is the user accessible name. The name **frgX** with **X** as an integer will cause a warning because of potential conflicts with automatically named devices.
Device	Name of the input card, see Table 6-16 and text above, please! If there are any computers defined, the name of the computer has to be prefixed. Separator after the computer name is a colon.

Table 6-20

```
//DEVICES IN THE OMNIBUS 1 of SERVER:
Grabber "QAVCs-1"
{
      device = server:frg3008[0];
}
Grabber "QAVCs-2"
{
      device = server:frg3008[1];
}
Grabber "QAVCs-3"
{
      device = server:frg3008[2];
}
Grabber "QAVCs-4"
{
      device = server:frg3008[3];
}
Grabber "SVCs-1"
{
      device = server:frg3008[4];
}
Grabber "SVCs-2"
{
      device = server:frg3008[5];
}
Grabber "SVCs-3"
{
      device = server:frg3008[6];
}
Grabber "SVCs-4"
{
      device = server:frg3008[7];
}
Grabber "RGBs-1"
{
      device = server:frg3008[8];
}
Grabber "RGBs-2"
{
      device = server:frg3008[9];
}

//DEVICES IN THE OMNIBUS 2 of SERVER:
Grabber "QAVCs-5"
{
      device = server:frg3008[10];
}
Grabber "QAVCs-6"
{
      device = server:frg3008[11];
}
//continued in the next column
```

```
Grabber "QAVCs-7"
{
      device = server:frg3008[12];
}
Grabber "QAVCs-8"
{
      device = server:frg3008[13];
}
Grabber "SVCs-5"
{
      device = server:frg3008[14];
}
Grabber "SVCs-6"
{
      device = server:frg3008[15];
}
Grabber "SVCs-7"
{
      device = server:frg3008[16];
}
Grabber "SVCs-8"
{
      device = server:frg3008[17];
}

//DEVICES IN THE OMNIBUS 1 of PROCESSOR-2:
Grabber "QAVCe-1"
{
      device = processor-2:frg3008[0];
}
Grabber "QAVCe-2"
{
      device = processor-2:frg3008[1];
}
Grabber "QAVCe-3"
{
      device = processor-2:frg3008[2];
}
Grabber "QAVCe-4"
{
      device = processor-2:frg3008[3];
}
Grabber "RGBe-1"
{
      device = processor-2:frg3008[4];
}
Grabber "RGBe-2"
{
      device = processor-2:frg3008[5];
}
```

DFRG

Each section beginning with **DFRG** defines the members of a group of distributed video and assigns this group a user accessible name. The input cards listed in this section are separated with comma.

DFRG	The name inserted in quotes is the user accessible name. The name **dfrgX** with **X** as an integer will cause a warning because of potential conflicts with automatically named devices.
Input device	Name of input cards as defined in Table 6-16 and text above. If there are any computers defined, the name of the computer has to be prefixed. Separator after the computer name is a colon. Instead the user defined name from section **Grabber** can be used!

Table 6-21

```
DFRG "DVid-1"
{
     QAVCs-1, QAVCs-5;
}

DFRG "DVid-2"
{
     server:frg3008[4], server:frg3008[14];
}
```

Sourcelist

Each section beginning with **Sourcelist** defines a group of video sources and assigns this group a user accessible name. Source names in a sourcelist must be unique, but each source can be used several times, with the same video type and preset.

Sourcelist	The name inserted in quotes is the user accessible name
“name”	Assigns a video source a name. The video sources are listed in the order they are connected to the video switcher.
video type	Assigns a video type to the video source. See section **Switcher** for definition of video types.
preset	Optional. Assigns a preset to a video source. This overwrites autodetection. **NTSC**, **PAL**, **SECAM**, **BW50** and **BW60** are possible presets.

Table 6-22

```
Sourcelist "analog video"        // defining video sources
{
     "RTL", Composite, PAL;
     "SAT 1", SVideo, PAL;
}
Sourcelist "RGB"                 // defining RGB sources
{
     "laptop", rgb;
     "computer", rgbhv;
}
```

ROUTES

The section **ROUTES** defines the routing of source lists to groups of distributed video or single video channels. The first entry in each line marks the source list; the last expression marks the routed video channel or distributed video. Several video channels or distributed videos can be listed, separated with a comma. Several lists can be routed to one video channel. The name of the video channel can be used as defined in Table 6-16. If there are any computers defined, the name of the computer has to be prefixed. Separator after the computer name is a colon. Instead the user defined name from section **Grabber** can be used. For distributed video the name defined in the **DFRG** section can be used!

```
ROUTES
{
      "analog video" to DVid-1;
      "analog video" to QAVCs-2, QAVCs-3, QAVCs-4;
      "analog video" to server:frg3008[11], server:frg3008[12], server:frg3008[13];
      "analog video" to processor-2:frg3008[0], processor-2:frg3008[1];
      "analog video" to processor-2:frg3008[2], processor-2:frg3008[3];
      "RGB" to RGBs-1, RGBs-2, processor-2:frg3008[4], processor-2:frg3008[5];
}
```

CABLES

The section **CABLES** defines the connection of analog sources to the input on the input cards. If a video switcher is used this is assigned in two steps, one line for the connection of a source to the video switcher input and an other line for the connection of an output of the video switcher to an input of an input card.

The first entry in a line indicates the origin of the signal, this is either the source or an output of the video switcher followed by the expression `to` and finally followed by the destination, which is a distinct input socket of the video switcher or of an input card.

video source	Name of the video source as entered in section **Sourcelist** in quotes.
video switcher	Name of the video switcher as defined in section **Switcher** and the socket number. Numbering begins with **1.** Name and number are separated by a point.
input card	Name of the input as defined in Table 6-16. If there are any computers defined, the name of the computer has to be prefixed. Separator after the computer name is a colon. Instead the user defined name from section **Grabber** can be used! Appended to the input name, separated by a point the connected port must be identified. This is with all cards except the DUAL DVI INPUT CARD always 1. For the DUAL DVI INPUT CARD specify the number that you would have selected in video.exe under **source**.

Table 6-23

If a source is connected to more destinations, the destinations can be listed one behind the other, separated by a comma or for each connection a single line.

```
CABLES
{
      "laptop"          to vsw0.2;
      "computer"   to vsw0.1;
      "RTL"        to vsw0.3;
      "SAT-1"      to vsw0.4;
      vsw0.1       to RGBs-1.1;
      vsw0.2       to RGBs-2.1;
      vsw0.3       to RGBe-1.1;
      vsw0.4       to RGBe-2.1;
      vsw1.1       to server:frg3008[0].1;
      vsw1.2       to server:frg3008[1].1;
      vsw1.3       to server:frg3008[2].1;
      vsw1.4       to server:frg3008[3].1;
      vsw1.5       to server:frg3008[10].1;
      vsw1.6       to server:frg3008[11].1;
      vsw1.7       to server:frg3008[12].1;
      vsw1.8       to server:frg3008[13].1;
      vsw1.9       to processor-2:frg3008[0].1;
      vsw1.10      to processor-2:frg3008[1].1;
```

```
        vsw1.11      to processor-2:frg3008[2].1;
        vsw1.12      to processor-2:frg3008[3].1;
    }
```

The compiler

After changing the switcher definition file, it has to be compiled and the data has to be inserted into the registry.

Execute the file **slc.exe** with the syntax:

`> slc.exe <switcher definition file> [-Option] [-Option] ..`

If no option is used and the compiler runs without an error through the switcher definition file, the changes in the registry are made immediately. Files with the registry changes are stored as well in the current folder with the name: **`<switcher definition file>.<computer name>.reg`** for archiving purposes.

Option	
?	print this help information
f	print result in text file only. No changes to registry permitted
p	print found paths for all input cards
dev	print found devices
def	print found definitions
c'filename'	select switcher definition file

Table 6-24

If multiple Processors are configured, each of them need to be in operation while the compiler is running. The user has to have administrator rights on each of these Processors.

The switcher definition language in the BNF notation

In the following the switcher definition language is declared in the BNF (Backus Naur Form):

```
alpha ::= 'a' .. 'z' | 'A' .. 'Z' | '-' | '!' | '_'
digit ::= '0' .. '9'
name ::= alpha {alpha | digit}
dev_name ::= name | ('"' name '"')
string ::= name | ('"' {any} '"')
number ::= digit {digit}
eq ::= '='
bits ::= '4' .. '8'
parity ::= 'n' | 'e' | 'o'
stopbits ::= '1' | '1.5' | '2'
file_name ::= name ['.' name]
sw_types ::= dev_name
frg_types ::= dev_name
sw_name ::= dev_name
cmp_name ::== string
sw_dev ::= sw_type '[' number ']' ['[' number ']']
listname ::= string
sourcename ::= string
dfrg_name ::= dev_name
frg_name ::= dev_name
frg_dev ::= [cmp_name':'] frg_type '[' number ']'
sw_output ::= (sw_name | sw_dev) '.' number
sw_input ::= sw_output
frg_input ::= (frg_name | frg_dev) '.' number

file ::= {section}
section ::= include | switcher | computer | grabber | dfrg | sourcelist | routes | cables
include ::= 'include' file_name
switcher ::= 'switcher' sw_name '{' {sw_def} '}'
computer ::= 'computer' cmp_name '{' {cmp_def} '}'
grabber ::= 'grabber' frg_name '{' grabber_def '}'
dfrg ::= 'dfrg' dfrg_name '{' dfrg_def '}'
sourcelist ::= 'sourcelist' listname '{' source_def '}'
routes ::= 'routes' '{' {route_def} '}'
cables ::= 'cables' '{' {cable_def} '}'
sw_def ::= device | connection | baudrate | type | inputs | outputs | level | videotype |
            ↳ host | port | remotetype
cmp_def ::= hostname | ipaddress
host ::= cmp_name
hostname ::= 'name' eq name';'
ipaddress ::= 'ipaddress' eq ip_def ';'
port ::= 'port' eq number
ipdef ::= digit[digit][digit].digit[digit][digit].digit[digit][digit].digit[digit][digit]
device ::= 'device' eq sw_dev ';'
connection ::= 'connection' eq name ';'
baudrate ::= 'baudrate' eq number ';'
type :== 'type' eq number
inputs ::= 'inputs' eq number ';'
outputs ::= 'outputs' eq number ';'
level ::= 'level' eq number ';'
videotype ::= 'videotype' eq vid_types ';'
grabber_def ::= 'device' eq frg_dev ';'
dfrg_def ::= (frg_name | frg_dev) {',' frg_name | frg_dev } ';'
source_def ::= source_descr {source_descr}
source_descr ::= sourcename ',' name [',' name] ';'
route_def ::= listname 'to' (frg_name | frg_dev | dfrg_name ){',' (frg_name | frg_dev |
            ↳ dfrg_name)} ';'
cable_def ::= sourcename | sw_output 'to' sw_input | frg_input {',' sw_input | frg_input}';'
```

6.1.4 Upgrading the display driver under Windows NT

An upgrade of the display driver release is not possible, the operating system is no longer supported; please refer to section 3.4 Operating system**.**

6.1.5 Upgrading the display driver under Windows 2000 or Windows XP

An upgrade of the display driver can be made, when a newer release offers additional features, which shall be applied for controlling the display wall.

Before starting the upgrade make sure, that the appropriate installation files are available. Therefore copy the folder with the latest display driver from the latest CD **TransForm A Suite CRS-3045-C** to the folder

```
c:\BARCO\TransForm A Suite\Windows Driver Suite (OVS-2686)
```

of the hard disk of the PROCESSOR.

If you utilize the Wall Management Software APOLLO make sure, that also APOLLO provides a release that is tested with the driver you are going to install.

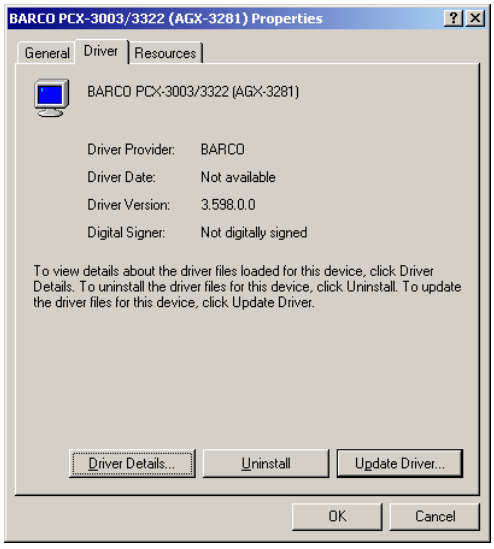
The left column explains the procedure under Windows 2000, the right column the procedure for Windows XP.

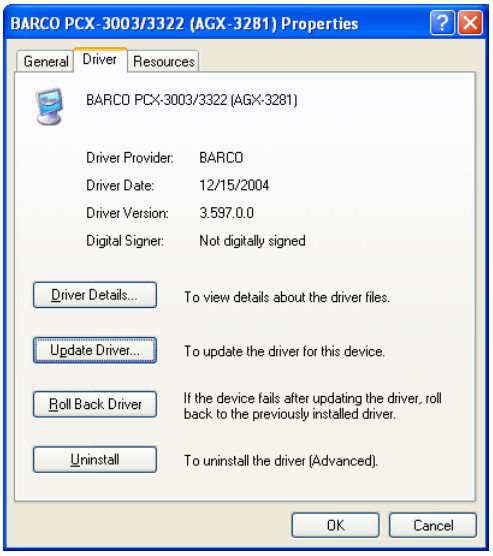
The installation dialogs display different device numbers, depending on the used TransForm A configuration. In an OmniBus configuration the Upgrade Device Driver Wizard refers to BARCO PCX-3003/3322 (AGX-xxxx), in a Processor configuration it just refers to BARCO AGX-xxxx. (This is because in an OmniBus configuration also the driver for the OmniBus device gets upgraded.) The example here refers to an OmniBus configuration.

Windows 2000

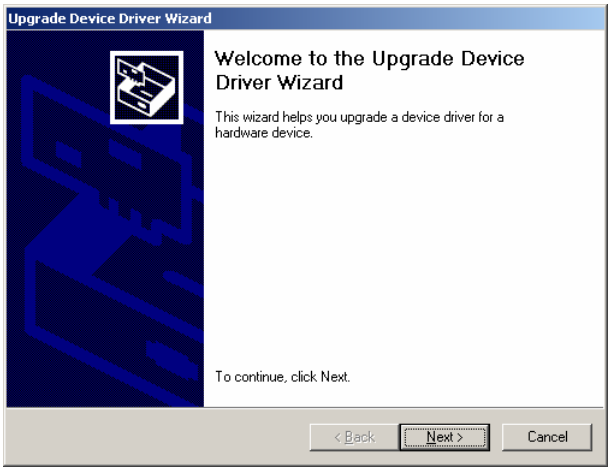
Windows XP

To update the display driver open the **Display Properties** dialog (**Start -> Settings -> Control Panel -> Display**). On the **Settings** Tab, click the **Advanced** button. This opens the **Default Monitor** dialog; go to the **Adapter** tab and press the **Properties** button. The **Properties** dialog appears. On the **Driver** tab you find driver information including the currently used driver version. Click the **Update Driver...** button.

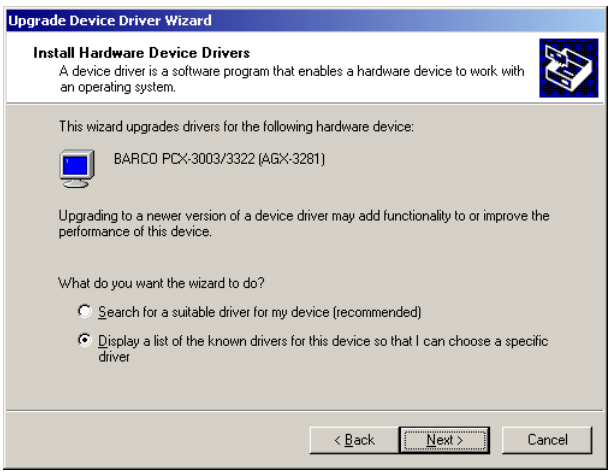




This starts the **Upgrade Device Driver Wizard**. Click **Next** to continue with the driver update.

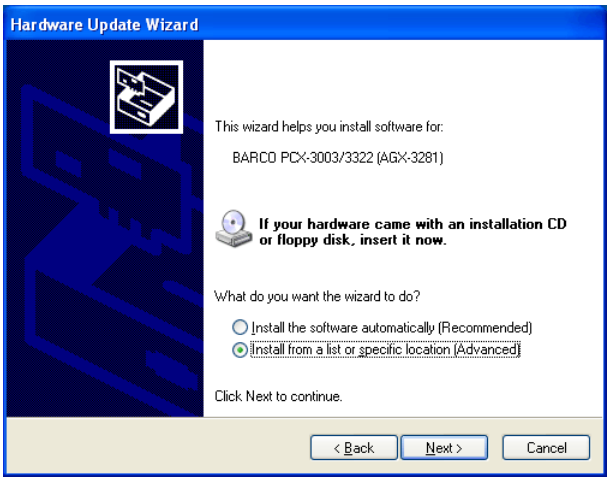


On the next window select the choice **Display a list of the known drivers for this device so that I can choose a specific driver** and click **Next**.

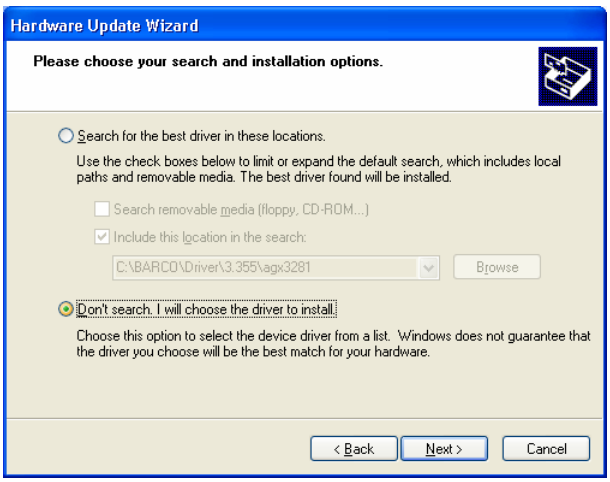


This opens the **Hardware Update Wizard**. It asks first for permission to use also the Windows Update Web site for to search for a suitable driver. Click **No, not this time** to prevent this and then **Next >**.

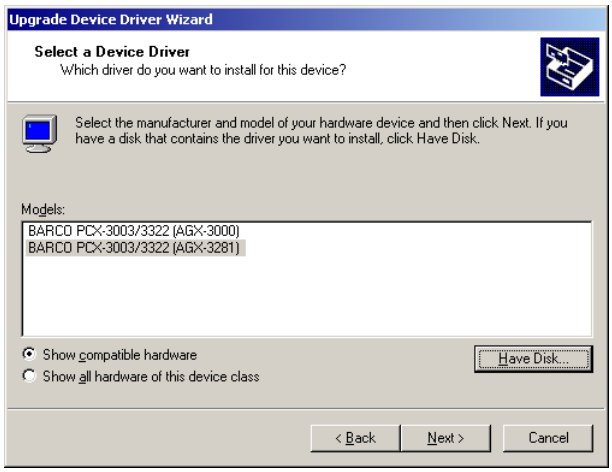
Then select **Install from a list or specific location (Advanced)** and click **Next >** to continue.

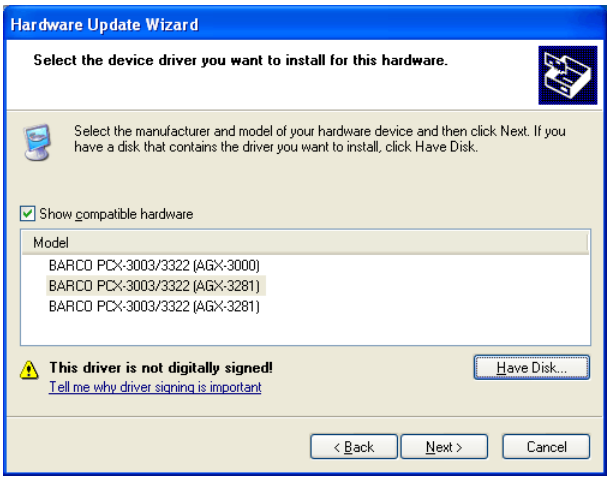


In the next window select **Don't search. I will choose the driver to install.** and click **Next**.

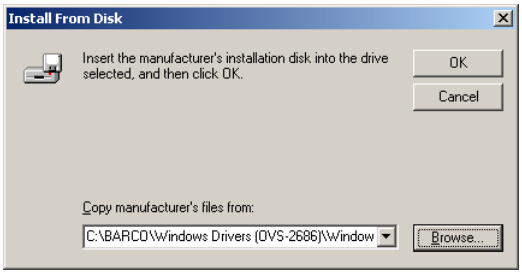


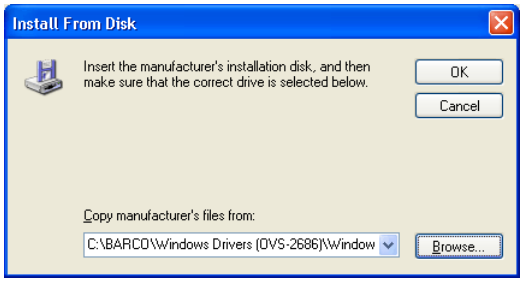
A list with the models of the display drivers appears.





Click the **Have Disk...** button.





Use the **Browse** button to specify the following path if your system is equipped with UGX GRAPHIC CARDS:

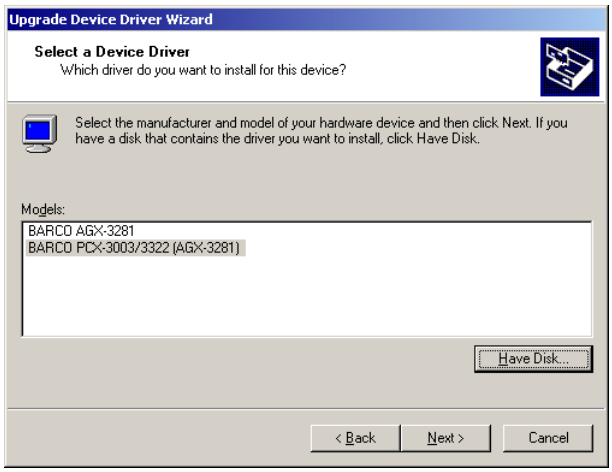
```
c:\BARCO\TransForm A Suite\Windows Driver Suite (OVS-2686)\
  ↳ Windows Driver Suite X.X\AGX3281\agx3281.inf
```

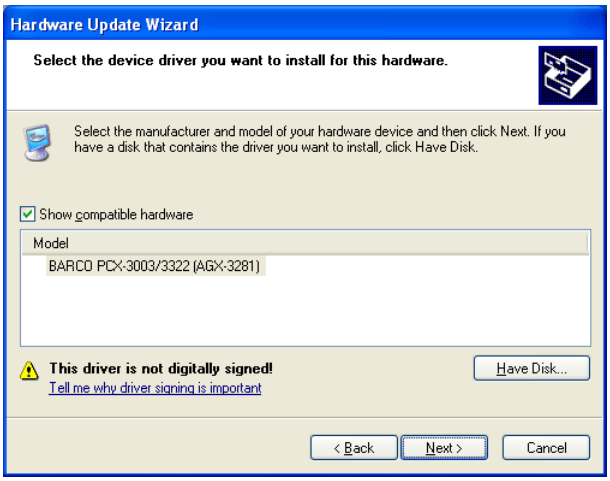
And specify respectively the following path, if your system is equipped with AGX GRAPHIC CARDS:

```
c:\BARCO\TransForm A Suite\Windows Driver Suite (OVS-2686)\
  ↳ Windows Driver Suite X.X\AGX3000\agx3000.inf
```

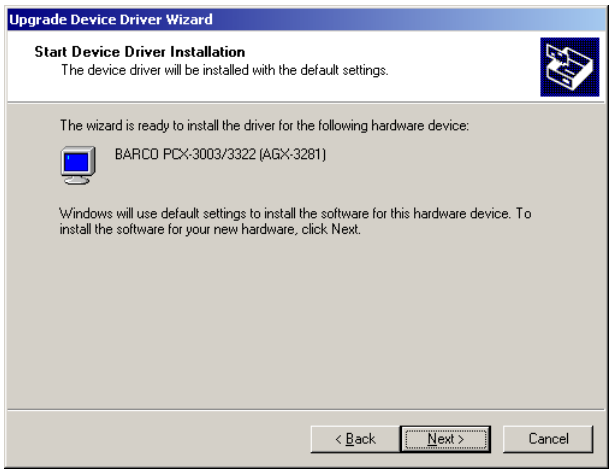
Also the folder `Windows Drivers X.X\INF\` contains a file `agx3281.inf` and `agx3000.inf`. These files may NOT be selected!

When the suitable folder is selected click **Next >**.

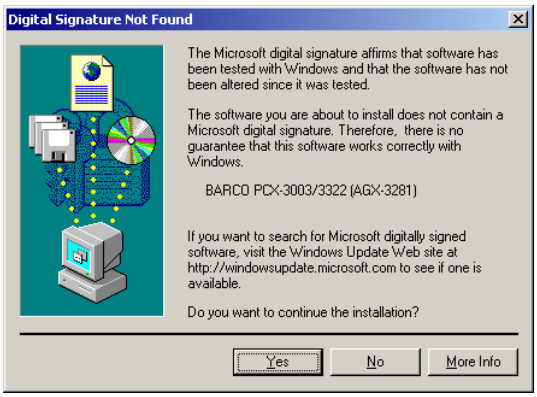




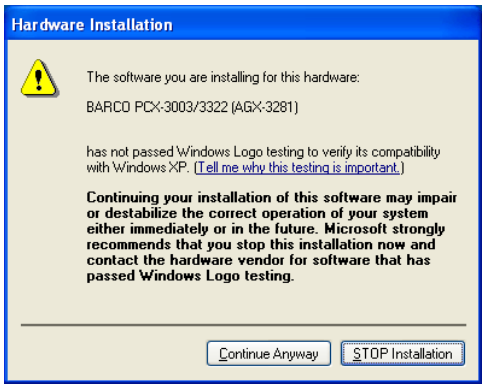
Now all information for the driver installation is selected. Click again **Next >**.



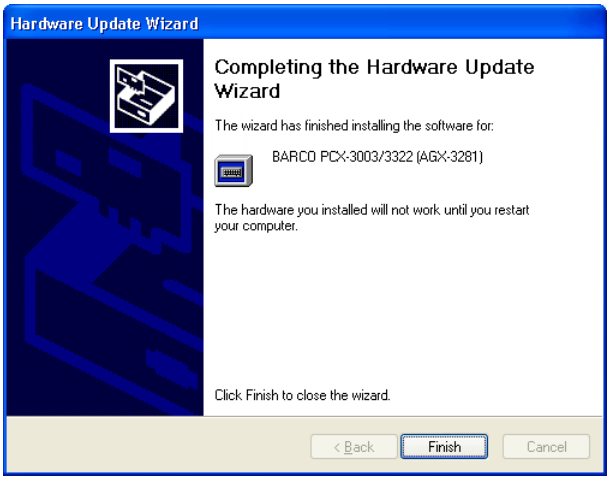
Windows 2000 might inform you that there is no digital signature for this software. Ignore this message and click **Yes**.



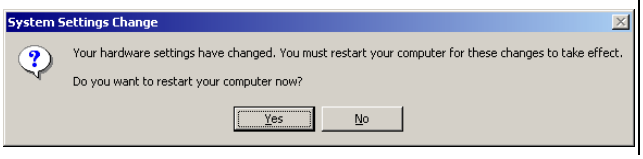
Windows XP might inform you, that the software has not passed the Windows Logo testing. Ignore this message and click **Continue Anyway**.

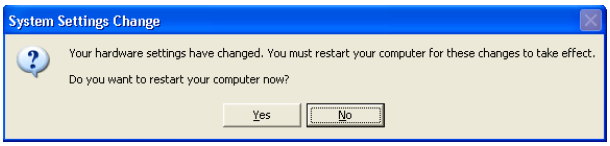


Now the files get copied and the display driver gets installed. Finally confirm the last dialog with the **Finish** button.



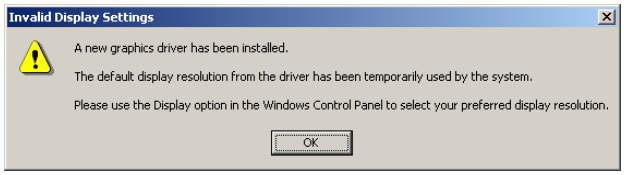
You will be prompted to restart the computer. But do not restart the computer at this time therefore click **No**.

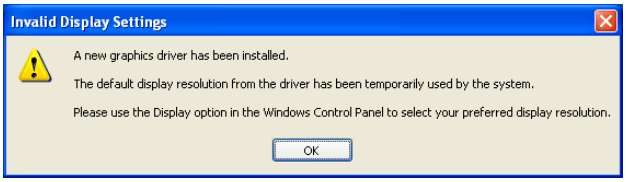




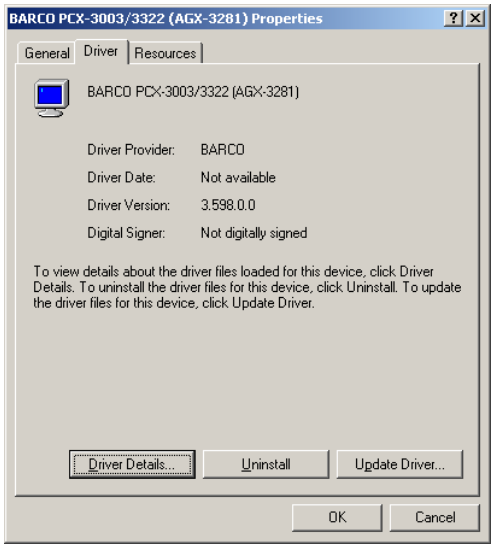
Now the file **setup.exe** must be executed. This is explained in detail in section 3.5.1 Installing the display driver and switcher language compiler in the subsection **Executing setup.exe**. Please follow the steps explained there.

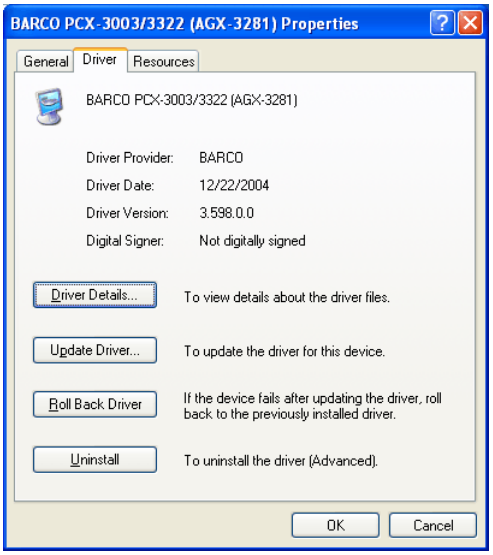
After doing so, including the final system reboot, the dialog informs about the new installed graphic driver. Just confirm this dialog with **OK** and you are ready with the display driver update. It is not necessary to reapply the display properties.





On the **Driver** tab of the **Properties** dialog, there is now the new driver version indicated.





6.1.6 Deinstallation of the display driver (agxuninst.exe)

If the Barco display driver has to be uninstalled, the tool `agxuninst.exe` should be used. This is necessary if e.g. exchanging AGX GRAPHIC CARDS with UGX GRAPHIC CARDS or if you want to revert to an earlier version of the display driver.

Please note:

agxuninst.exe removes also the complete video configuration, made with the switcher language compiler SLC, please refer to section 6.1.3 Configuring video**.**

To execute `agxuninst.exe`, you must be logged in as administrator. The file is located on the harddisk in the following directory:

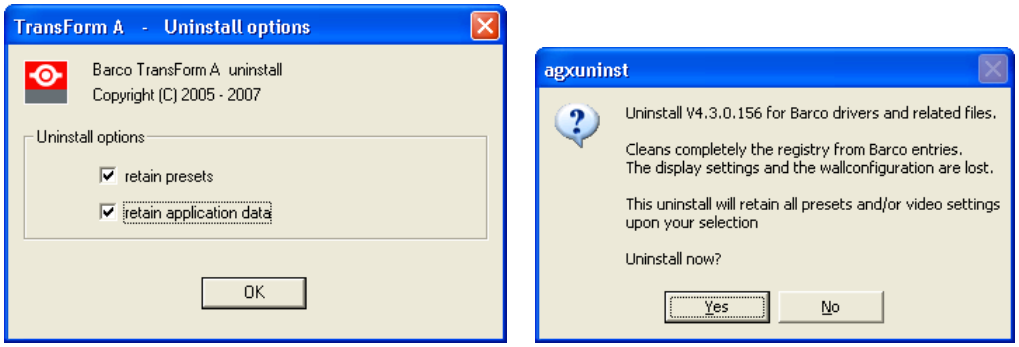
```
c:\BARCO\TransForm A Suite\Windows Driver Suite (OVS-2686)\
  ↳ Windows Driver Suite X.X
```

agxuninst.exe can only be run successfully, when no instance of DEX, MonAgent or Apollo is running. Close DEX and Apollo applications and stop the MonAgent service before executing agxuninst.exe.

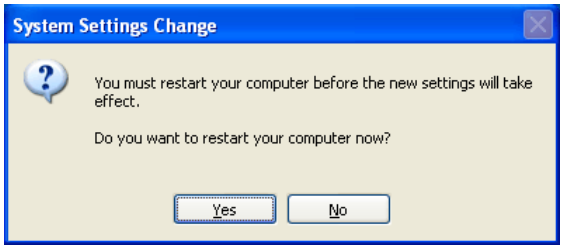
With a double click on the file the uninstall application is started. First the uninstall options must be selected.

- **Retain presets**
  The RGB and YUV presets for DUAL RGB INPUT CARD and DUAL DVI INPUT CARD and stream presets for the STREAMING VIDEO CARD can be retained. Enabling the checkbox will preserve your current presets so that they are still in place after a re-installation of the display driver. Otherwise just the default presets will be available.
- **Retain application data**
  The configuration files for the video channels can be retained.

With the next dialog the de-installation of the driver can be started. To uninstall confirm with **Yes**.



Then the de-installation is running. When done you are asked to reboot the computer. Confirm again with **Yes**.



After this a new display driver must be installed. If you want to revert to an earlier driver release please refer to the user's manual that was provided with that driver software for an instruction of the installation!

Command line based usage of agxuninst.exe

`agxuninst.exe` can also be executed on the command line enabling the use of some additional options. The table below lists these options:

Options of agxuninst.exe	
`log`	enables logging in a local file (`agxuninst.log`)
`slc`	uninstalls only switcher language compiler related registry entries
`prs`	retains presets registry entries (same function as **retain presets** above)
`? h help`	displays the help dialog

Table 6-25
Options of agxuninst.exe

To run the program open a command prompt and change to the directory `c:\BARCO\TransForm A Suite \Windows Driver Suite (OVS-2686)\Windows Driver Suite X.X`

```
c:\BARCO\TransForm A Suite\Windows Driver Suite (OVS-2686)\
  ↳ Windows Driver Suite X.X>agxuninst.exe /<option>
```

The application will run without further notification.

6.1.7 Special requirements when installing Windows 2000/XP

If you want to reinstall and configure Windows 2000 or Windows XP on the TRANSFORM A hard disk, a special procedure is required. The following description points out the details that must be considered to achieve a system that optimally supports the TRANSFORM A hard- and software, but it is not meant as a complete description of a Windows 2000/XP system installation.

Required parts

For the installation, the following CD-ROMs are necessary:

- Microsoft Windows 2000 Professional
- or Microsoft Windows XP Professional respectively
- **CRS-3045-C**, TRANSFORM A Suite for Windows 2000/XP

Boot sequence

In the BIOS-settings, set the boot sequence to 1. **Floppy**, 2. **ATAPI CD-ROM**, 3. **IDE Hard Drive**. If the hard disk is already partitioned you have to press a key when the text: `Press any key to boot from CD ...` appears. If the hard disk is not yet partitioned, the system boots automatically from CD.

Partition size

When you are asked for the partition size, create a partition with address **c:** . The size of this partition must be at least 8 GB. Format this partition in NTFS file system. If there is already a partition with these properties, it is nevertheless recommended to reformat it.

Boot sequence

When rebooting change again the boot sequence in the BIOS-settings to 1. **Floppy**, 2. **IDE Hard Drive**, 3. **ATAPI CD-ROM**. Windows 2000/XP boots now from the hard disk.

BIOS-settings

With **AGS-3390-1/-2** please make sure that the following BIOS parameters are set as given below:

Advanced	**Boot Features**	**Quiet Boot Mode:**	**Disabled**
		Power Loss Control:	**Stay Off**
		POST Errors	**Disabled**
	PCI Configuration	**Default Primary Video Adapter:**	**Other**
		ROM Scan Ordering:	**Addon First**
	Hardware Monitor	**Fan Speed Control Modes:**	**5) 4-pin (Workstation)**
	Processsor options	**execute disable bit**	**Disabled**

Licensing

Amongst other you will be prompted to insert the license number of your Windows 2000/XP. The license number is labeled on the inside of the front flap of the PROCESSOR. After the system copied files to the hard disk the installation is ready and you are prompted to remove the CD from the drive and to reboot the computer.

If the network identification Wizard comes up, then leave it with **Cancel**.

Boot.ini

With **AGS-3390-1/-2** the boot.ini has to be adapted. By default the file is located directly on drive c:

```
C:\boot.ini
```

Being a system file it is usually not shown in Windows Explorer. Therefore change the settings of Windows Explorer accordingly (**Tools** -> **Folder Options** -> **View** -> **Hidden Files and Folder** -> select **Show hidden files and folders** and not selected **Hide protected operating system files**). The file is also by default write protected. After a right click on the file select properties from the drop down menu and make sure that read-only is not selected. Then open the file with an editor and look for a line starting with `multi(0)disk(0)rdisk(0)partition(1)`. Make sure that **`/NOPAE`** is added to the list and that **`/NoExecute`** has the parameter **`AlwaysOff`** which then reads as **`/NoExecute=AlwaysOff`**

```
[boot loader]
timeout=30
default=multi(0)disk(0)rdisk(0)partition(1)\WINDOWS
[operating systems]
multi(0)disk(0)rdisk(0)partition(1)\WINDOWS="Microsoft Windows XP Professional" /fastdetect
↳ /NOPAE /NoExecute=AlwaysOff
```

Graphic driver

Now the display drivers must be installed. Proceed as explained in section 3.5.1 Installing the display driver and switcher language compiler.

Update of network card driver

Insert the CD TransForm A Suite into the CD-ROM drive and setup the driver of the network adapter by means of a driver update in the device manager. Therefore open the device manager (**Start -> Settings -> Control Panel -> System -> Hardware** Tab **-> Device Manger ...**). Here you can select the suitable driver from the TransForm A Suite. For this purpose there is an overview on the TransForm A Suite, about which driver should be selected depending on the network card and the used operating system.

Windows service pack

Install the suitable recommended service pack, please refer to section 3.4 Operating system. Take care to install the service pack in the same language, like your Windows installation. The service pack for Windows 2000 can be found in the directory:

```
<CDROM>:\3rd party\Windows 2000 SP4\
```

The service packs for Windows XP are part of the Windows XP system CDs.

Increasing desktop heap size

The desktop heap size must be adjusted in the registry, please refer to section 6.1.2 Registry reference (SharedSection).

Optimizing mouse cursor for TransForm A system

For the optimal display of the mouse pointer when moved on video windows, deactivate the pointer shadow (**Start -> Settings -> Control Panel -> Mouse -> Pointers** Tab **-> Enable pointer shadow**), please refer also to section 3.6.1 Appropriate cursor for video applications for further information on software and hardware cursor.

6.1.8 Adjustment of language settings under Windows XP

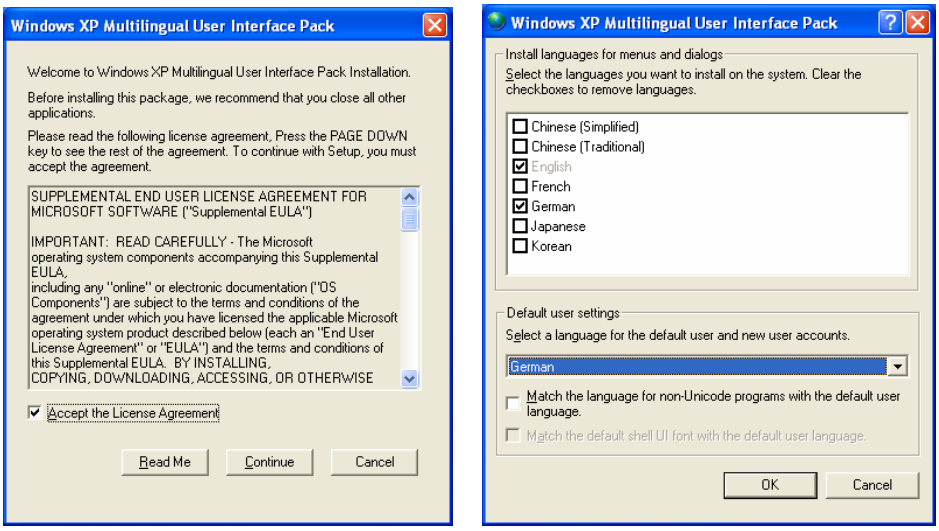
With Windows XP the language for the user interfaces can be changed. The following instruction guides through the procedure.

Installation of an additional language

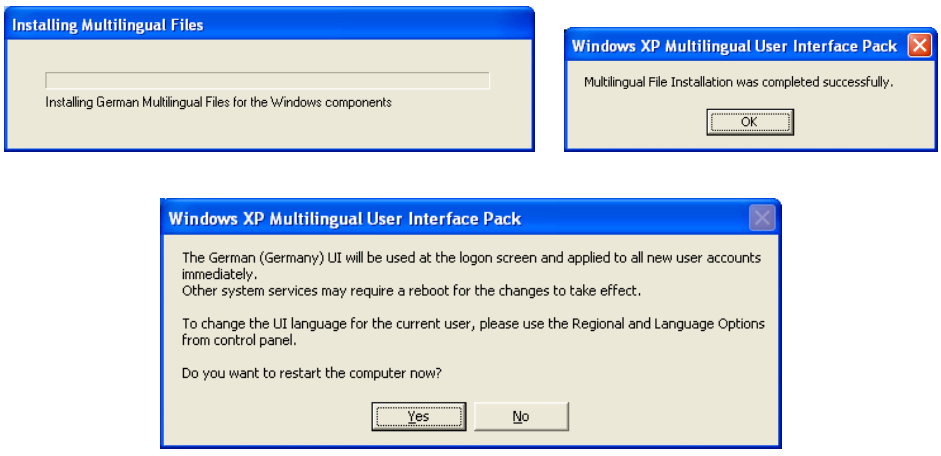
Insert the suitable CD **MS Windows XP Professional – Multilingual User Interface** (4 CDs with the various languages) into the CD-ROM drive. A dialog comes up which guides you through the installation.

Close all other applications, select **Accept the License Agreement** and click **Continue**.

In the next dialog keep English selected and in addition select the intended language. From the **Default user settings** list select also the intended language.

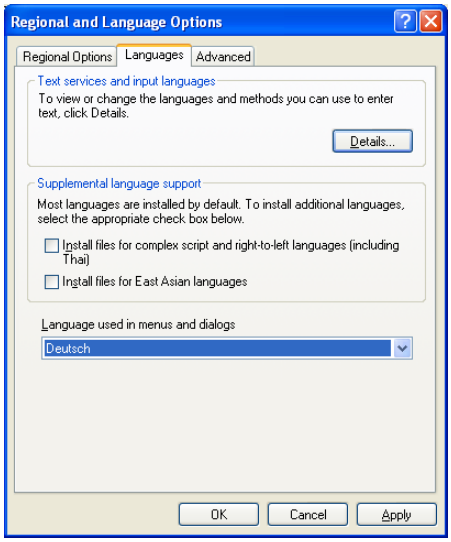


After clicking **OK**, the language files get installed. Confirm the completed multilingual installation with **OK** and reboot the computer by clicking **Yes**.

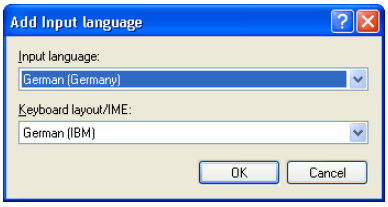


Adding a language to the system

After reboot, open the **Regional and Language Options** dialog (Start -> Settings -> Control Panel -> Regional and Language Options). Click the **Languages** tab and then the **Details** button.



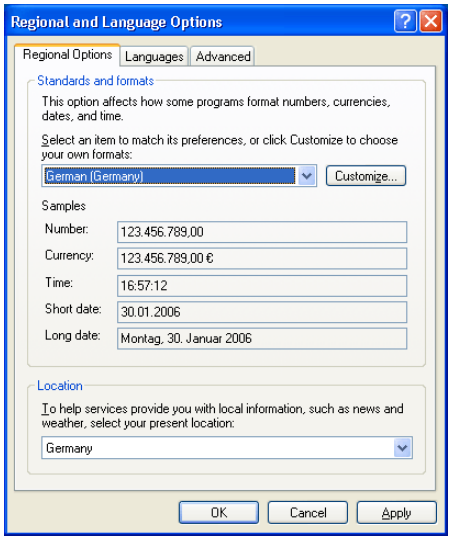
If the intended language is already in the **Default input language** list, just select it. Otherwise click the **Add** button and select the intended language from the **Input language** list and the type of the keyboard from the **Keyboard layout/IME** list. Click **OK** to confirm.

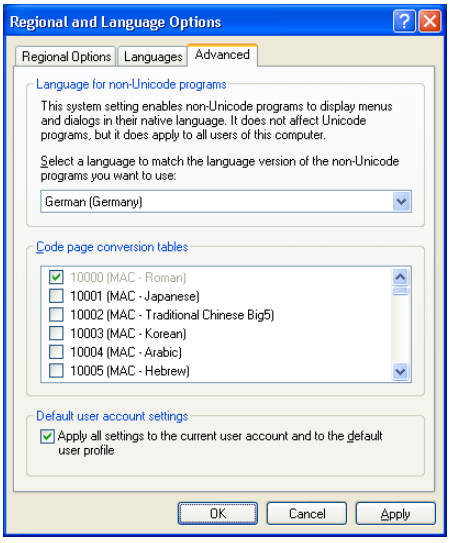


Now you can select the intended language from the **Default input language** list. Click **Apply**. Back on the former dialog choose the intended language also from the **Language used in menus and dialogs** list.

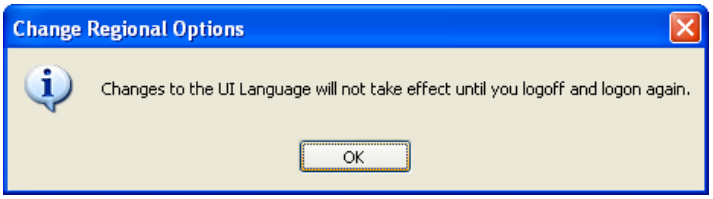
On the **Regional Options** tab select the intended language from the **Standards and formats** list and your present location.

On the **Advanced** tab select the intended language also from the list for non-Unicode programs and enable the **Default user account settings**. When done click the **Apply** button





Confirm the following two messages with **OK** and **Yes**.



The new language settings get applied after a restart.

6.1.9 Installing display drivers for new cards or an OmniBus device

If the display driver was already installed on TRANSFORM A, then after expanding the system with additional components a hardware check will detect the new device when switching on TRANSFORM A. This is in particular the case:

- **In an OmniBus configuration** after connecting an additional OMNIBUS
- **In a Processor configuration** after inserting additional graphic cards, OMNISCALERS or input cards

The installation of the display drivers for the new device is started automatically.

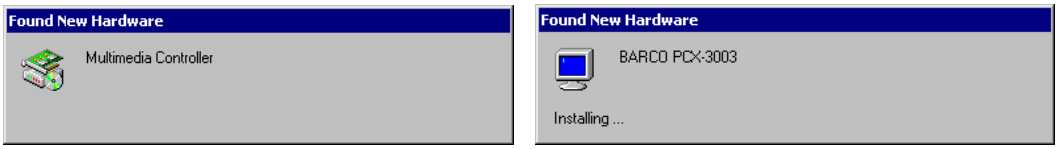


Figure 6-5
New Hardware found and driver installation (in this case for an OMNIBUS A18)

After the installation is finished you have to confirm **Finish**:

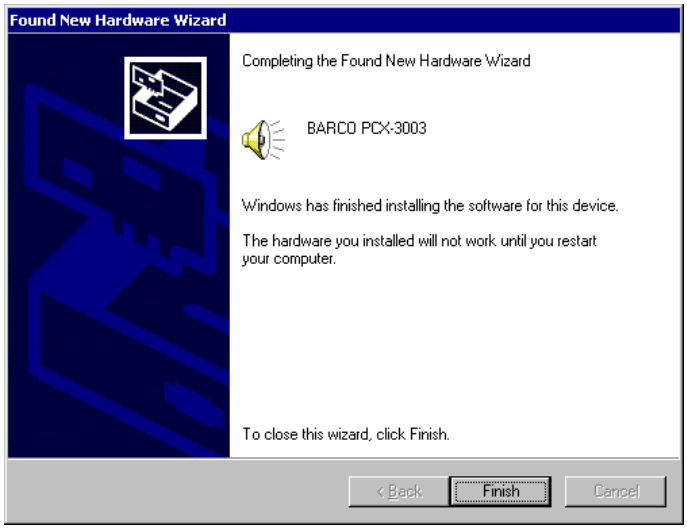


Figure 6-6
installation is finished

You will be prompted to restart TRANSFORM A.

- **In an OmniBus configuration** confirm with **Yes**
- **In a Processor configuration**, if inserting multiple new cards click **No** and just reboot one time manually after the procedure explained above has been run through for all cards.

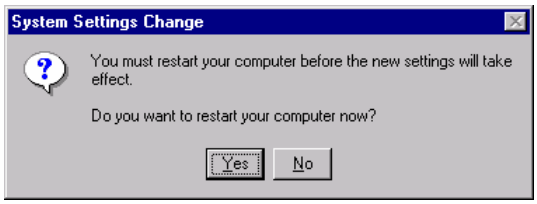


Figure 6-7
system settings change

If you inserted graphic cards in TransForm A you have to configure these graphic cards, see section 3.5.2 Configuring the display driver.

6.1.10 Windows XP activation

Windows XP must once be activated after the installation. This is already done in the factory. Nevertheless, after too many hardware changes, it might be necessary to activate Windows XP again. Therefore start the Windows activation (**Start -> Accessories –> System Tools –> Activate Windows**). You can activate Windows XP via the Internet or telephone depending on your preferences.

6.1.11 Redundant network adapter

To obtain a redundant network connection to the LAN the PROCESSOR can be equipped with multiple network cards that form an AFT (Adapter Fault Tolerance) team. A team consists of two or more network cards of the same type, either exclusively 10/100 Mbps network cards or exclusively 10/100/1000 Mbps network cards. At least one of the cards must be a server adapter. The other ones can be server or desktop adapters. Nevertheless we recommend for a redundant network adapter to use exclusively server adapters to achieve an easy spare part handling.

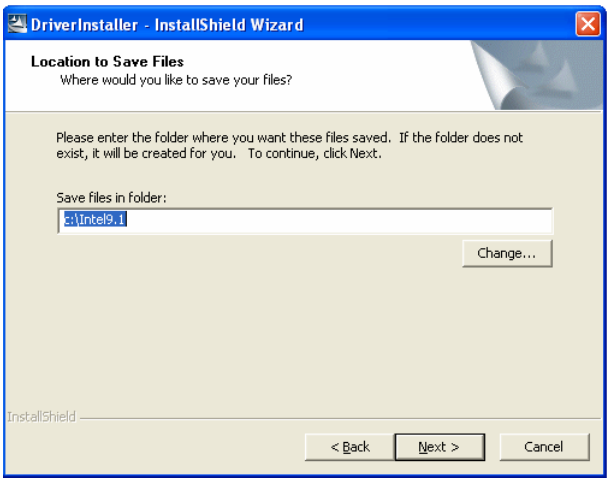
Installing a network driver enabling teaming mode for Ethernet card 1000 Mbps

The Ethernet card 1000 Mbps requires the Intel PROset driver 9.1 or newer for the configuration of the teaming mode. TRANSFORM A delivered with display driver release 3.6 or newer have this network driver already installed. If you want to setup teaming mode with the Ethernet card 1000 Mbps on a system delivered at an earlier time, first the network driver has to be installed. This is explained in this section:

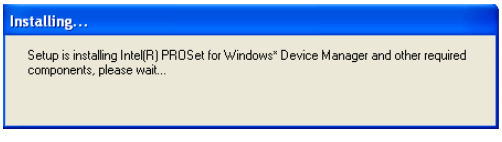
You find the driver on the **TransForm A Suite CRS-3045-C** under the following path:

```
3rd Party\Intel Ethernet Adapter 10.3.0.0
```

Double click the file `pro2kxp91.exe`. On the InstallShield Wizard read the license agreement and then select **I accept the terms in the license agreement** and click **Next**. In the following you are prompted to enter a folder name for the driver files on the hard disk. Accept the suggested name with **Next**.

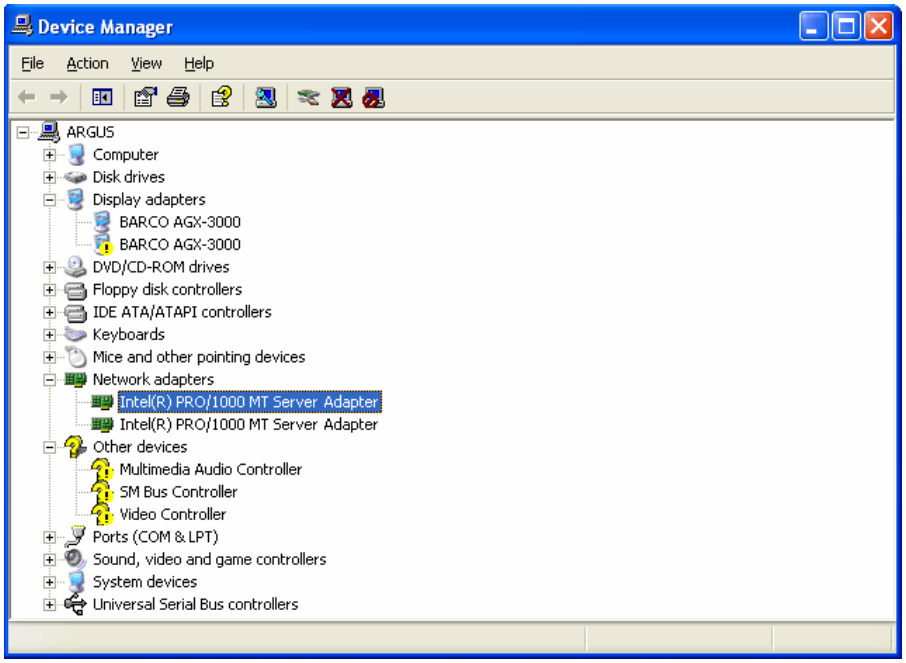


When the next dialog appears, click **Install Drivers**. This starts the installation. The installation process is indicated by a small window. As soon as it disappears click the **Exit** button.

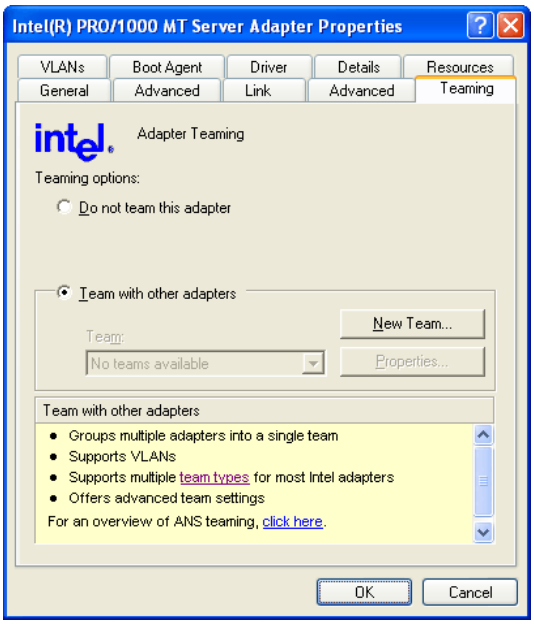


Configuration of an AFT team

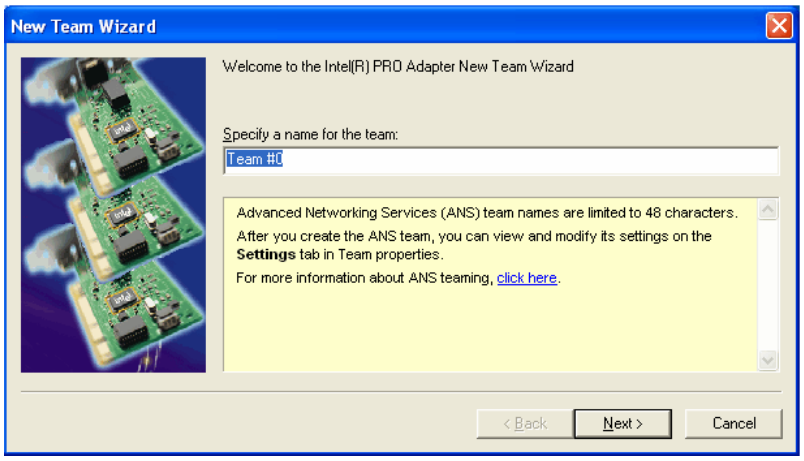
To configure an AFT team you must be logged in as administrator. Open the device manager (**Start -> Settings -> Control Panel -> System -> Hardware** Tab **-> Device Manager ...**).



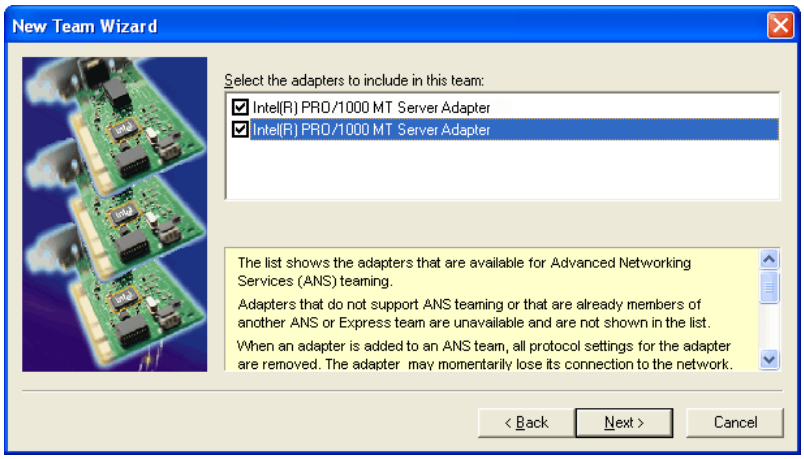
From the list of devices select **Network Adapters**. Right click on the entry of an Intel(R) PRO/1000 NT Server Adapter and select **Properties** from the context menu. This opens the Intel(R) PRO/1000 MT Server Adapter Properties dialog.



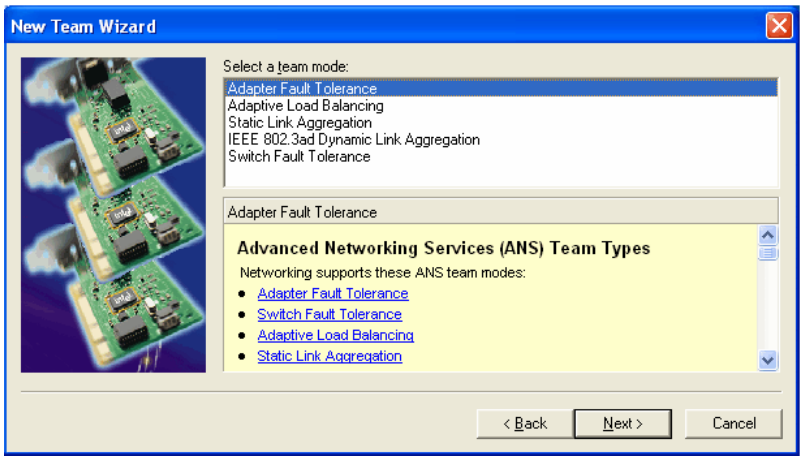
Select **Team with other adapter** and click the **New Team...** button. The **New Team Wizard** comes up. If first prompts you to enter a name for the team. After specifying a name, click the **Next** button.



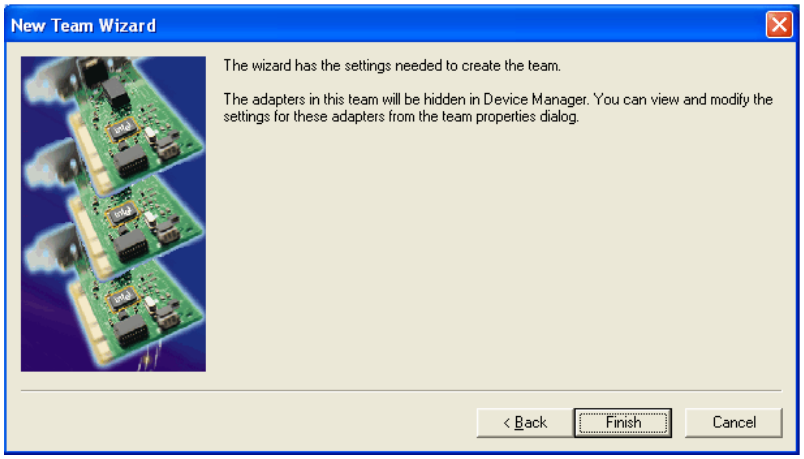
The next screen lists all network adapters that are available for an AFT team. Select the checkboxes of all cards that shell be part of the team and click **Next >**.



Now a list of team modes is displayed. Select the entry **Adapter Fault Tolerance** and click the **Next** button.

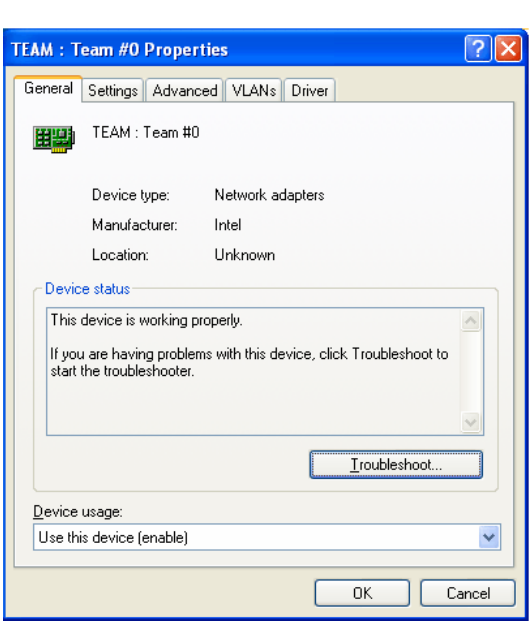


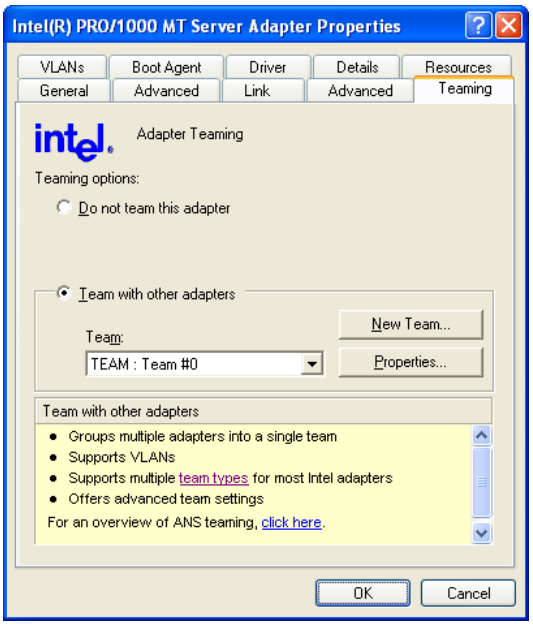
Finally click the **Finish** button to configure the team to the system.



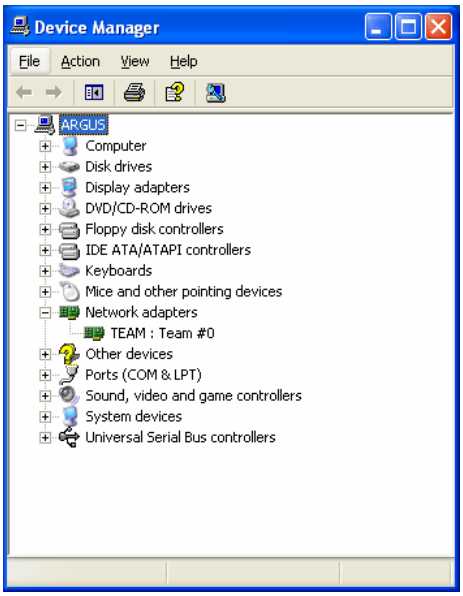
When the configuration is done the Wizard disappears and the **Team Properties** dialog comes up. You can close this dialog with clicking **OK**.

Also the Server Adapter Properties dialog is still open. In the **Team** list there is now an entry with the new built team. Close also this dialog with **OK**.



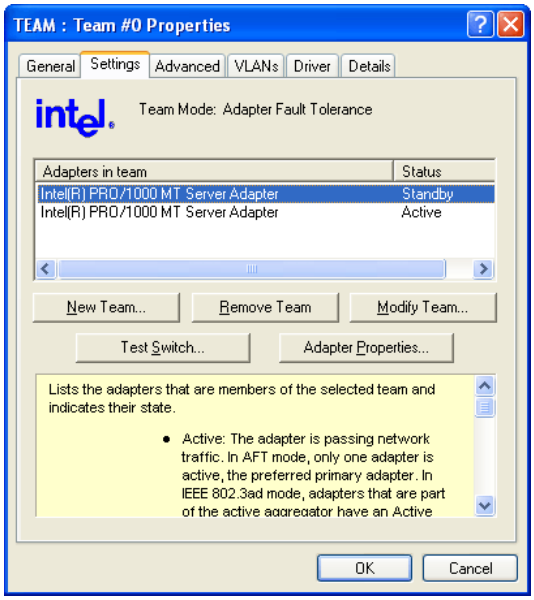


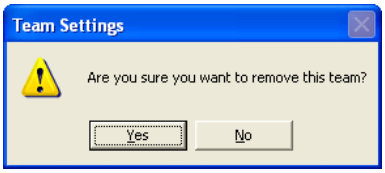
In the **Device Manager** appears now an entry of the AFT team instead of the single network adapters.



Revoking an AFT team

The members of an AFT team can be released as well. To achieve this log in as **administrator** and open the **Device Manager** as explained above. Do a right click on the Team entry and select **Properties**. The **Team Properties** dialog opens. On the **Settings** tab click the **Remove Team** button. After confirming another dialog the team gets removed and the network cards are again individually available.





6.1.12 Genlock

The refresh rate of the projection module is in general not synchronized to the refresh rate of the video. As a result the display of the video can look jerky. Genlocking can avoid this unwanted behavior by providing the data signals to the projector at a refresh rate which is perfectly adapted to one video source. A Source of a QUAD ANALOG VIDEO CARD, a DUAL DVI INPUT CARD or a STREAMING VIDEO CARD can be used for genlocking.

Genlock is available in an OmniBus configuration only!

Usage

Genlock is controlled by means of the command line tool **genlock**. To use it open a command prompt and enter **genlock** with the respective options, like e.g.:

```
C:>genlock /sel:frg0
```

to specify the input card, that provides the video source that is used for genlocking.

The following options are available:

Option	
	calling **genlock** without option returns the complete options list
`/start`	initializes the genlock utility this must first be entered to enable the further functionality
`/sel:[<FRG-name>|EXT|INT]`	`<FRG-name>` selects the input card, whose signal shall be used for genlocking; either the system default names or the names defined in the switcher definition file, see section 4.3.2 Naming of video channels and video sources, can be used. `EXT` selects external input. `INT` selects the first UGX or AGX GRAPHIC CARD.
`/on`	data on the projection modules is displayed in sync Before using `/on` first a source must be selected with the option `/sel`
`/off`	displaying in sync is stopped.
`/sts`	returns for all graphic cards the state of the parameters that are relevant for genlocking
`/stop`	de-initializes the genlock utility this should be called to properly exit the **genlock** tool

Table 6-26
Options of genlock

The actual state of the genlock utility is stored in the registry. Therefore after a reboot automatically the same genlock settings as before are applied.

When using genlock make sure, that the cabling for genlock has been established as explained in section 3.2.14 CPU board.

If an external signal is connected only external may be selected. If selecting internal or a video signal it will be disturbed by the external signal. Therefore the external signal should be unplugged before switching to an other type of genlock!

6.1.13 Device Explorer

The **DEvice EXplorer DEX** is an application that provides access to current system variables and configuration information of your TRANSFORM A system. The status of critical system resources of PROCESSOR and OMNIBUS devices can be monitored and the configuration of the system can be read out.

DEX can be started either by entering **dex** to the command line, e.g.:

```
C:\dex
```

or by using the Run command (**Start** -> **Run**), then entering **dex** into the **Open** line and clicking **OK**.

When **DEX** starts, it shows by default the component view, as shown in the figure below.

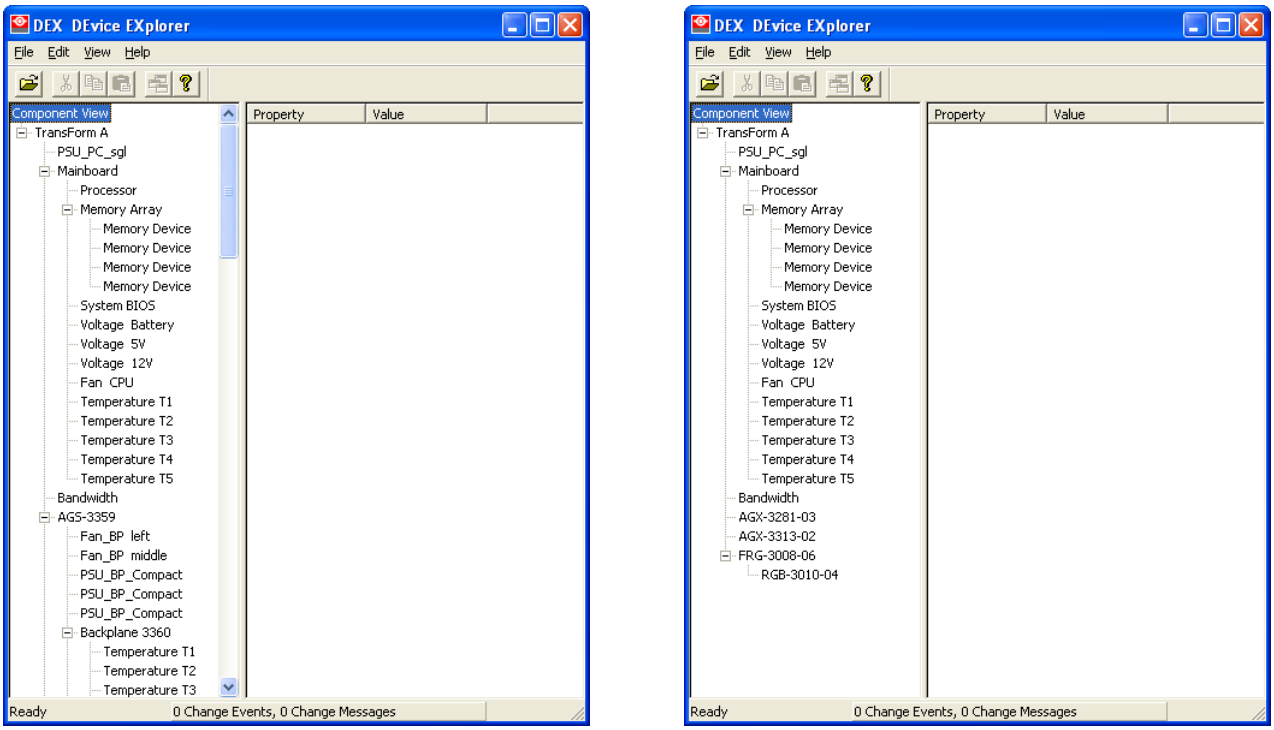


Figure 6-8
Device Explorer in component view for an OmniBus configuration (left) and Processor configuration (right)

DEX provides two different views on the properties of the system: Component View and Channel View. To switch between these two views click on **View** in the menu bar and select **Options**. The **DEX – Options** dialog appears. There you can select either **Component** or **Channel View**.

On this dialog also the synchronization mode can be selected. By default **Async. Update** is not selected. This means that the system properties are read once and are not updated while the DEX is running. To regularly synchronize (every 5 seconds) the values, select the **Async. Update** checkbox.

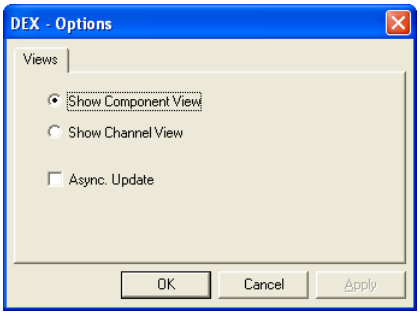


Figure 6-9
DEX – Options dialog

Component view

The component view of the DEX shows its information in a hierarchical structure, which means that a component that is contained in a device is listed as a subentry of this device. This allows you in an OmniBus configuration to see which video input cards are plugged into which OMNIBUS and again to which PROCESSOR this OMNIBUS is connected. With a Processor configuration the PROCESSOR and optional EXTENDERS are commonly represented in the TRANSFORM A entry. The graphic cards, OMNISCALERS and input cards are direct subentries of TRANSFORM A.

The information provided by the component view are basically article numbers of the parts used in TRANSFORM A, the version of firmware and controlware as well as configuration values like the PCI slot used for a card and real-time status values like e.g. temperatures. If a value appears in DEX depends from the used hardware and from the used OmniBus or Processor configuration.

The table below lists some of the most important values from the extensive list of information given by DEX:

entry	**meaning** **properties of interest**
TransForm A	PROCESSOR
Mainboard	mainboard information
Hard Disk	list of SMART attributes; SMART attributes are manufacturer dependent (available with AGS-3390)
RAID Subsystem	information about individual RAID disks
Processor	used processor
Memory Array	overall memory information: memory capacity, memory population
Memory Device	usage of the individual memory sockets
System BIOS	BIOS type and version
Voltage Battery	voltage of the battery (not available in AGS-3390) **Reading** Current voltage
Voltage 5V	voltage at the 5 V line (not available in AGS-3390) **Reading** Current voltage
Voltage 12V	voltage at the 12 V line (not available in AGS-3390) **Reading** Current voltage
Fan CPU	CPU fan (not available in AGS-3390) **Reading** Current revolutions
Temperature	temperature at one of the 5 sensors on the mainboard (not avail. in AGS-3390) **reading** Current temperature
Bandwidth	current bandwidth consumption in the whole system **Reading** bandwidth consumption in Bytes/s
AGS-3013/3320	OMNIBUS A18
AGS-3335	OMNIBUS A18 with power modules that can be monitored as well
AGS-3359	OMNIBUS A12
Fan_BP left, middle, right	left, middle or right fan seen from front of the device (right fan is not available with AGS-3359) **Reading** Current revolutions
PSU_BP_rdd	power module (only available in AGS-3335!)
Voltage	3 entries per power module for 3.3V, 5V and 12V **Reading** Current voltage

Current	3 entries per power module for 3.3V, 5V and 12V **Reading** Current current
Temperature T1	Temperature of the power module **Reading**
Backplane 3003	backplane of AGS-3013/3320 **IDPROM Version, Firmware**
Backplane 3322	backplane of AGS-3335 **IDPROM Version, Firmware**
Backplane 3360	backplane of AGS-3359 **IDPROM Version**
Temperature T1, T2, .. , T6	current temperature at one of the 5 or 6 sensors on the backplane (AGS-3013/3320 and AGS-3335 have each 6 sensors, AGS-3359 has 5 sensors) **Reading** Current temperature
Bandwidth	current bandwidth consumption of the backplane **Reading** bandwidth consumption in Bytes/s
BP-CPU 3153	CPU board of OMNIBUS AGS-3013/3320 **IDPROM Version, Firmware**, **Controlware**
BP-CPU 3323	CPU board of OMNIBUS AGS-3335 or AGS-3359 **IDPROM Version, Firmware**, **Controlware**
Temperature T1	current temperature at the sensors of the CPU board **Reading** Current temperature
AGX-3281-xx, AGX-3000-xx	UGX / AGX GRAPHIC CARD **Connector Position** (indicates the used PCI slot 0..17 in OMNIBUS A18, 0..11 in OMNIBUS A12), **IDPROM Version, Firmware, Controlware**
AGX-3313-xx, AGX-3002-xx	OMNISCALER **Connector Position, IDPROM Version, Controlware**
FRG-3008-xx, FRG-3355-xx	Input cards consist of two boards. This entry indicates the base board of the input cards. **Connector Position, IDPROM Version, Firmware, Controlware**
FRG-3009-xx, FRG-3397-xx	QUAD ANALOG VIDEO CARD mezzanine board **Connector Position** (same number as corresponding base board), **IDPROM Version, Controlware, Channel Names** (frg<x> or user defined by switcher language compiler)
RGB-3010-xx	DUAL RGB INPUT CARD mezzanine board **Connector Position** (same number as corresponding base board), **IDPROM Version, Controlware, Channel Names**
SDI-3011-xx	QUAD SDI VIDEO CARD mezzanine board **Connector Position** (same number as corresponding base board), **IDPROM Version, Firmware, Channel Names**
MPG-3012-xx	STREAMING VIDEO CARD SVC-1 mezzanine board **Connector Position** (same number as corresponding base board), **IDPROM Version**, **Ident Number** (MPG-3012-0x for STREAMING VIDEO CARD SVC-1), **R76-Number** (R765140 or R764244 for STREAMING VIDEO CARD SVC-1), **Channel Names**

MPG-3012-xx	STREAMING VIDEO CARD SVC-2 mezzanine board **Connector Position** (same number as corresponding base board), **IDPROM Version**, **Ident Number** (MPG-3012-1x for STREAMING VIDEO CARD SVC-2) **R76-Number** (R765303 for STREAMING VIDEO CARD SVC-2) **Channel Names**
FRG-3388-xx	DUAL DVI INPUT CARD mezzanine board **Connector Position** (same number as corresponding base board), **IDPROM Version, Controlware, Channel Names**
JPG-3398-xx	STREAMING VIDEO CARD J2K mezzanine board **Connector Position** (same number as corresponding base board), **IDPROM Version, Channel Names**

Table 6-27
DEX – entries of component view

Channel view

The **channel view** lists information about how the hardware is used and configured to setup the display wall. It is organized according to the way one looks at the display wall.

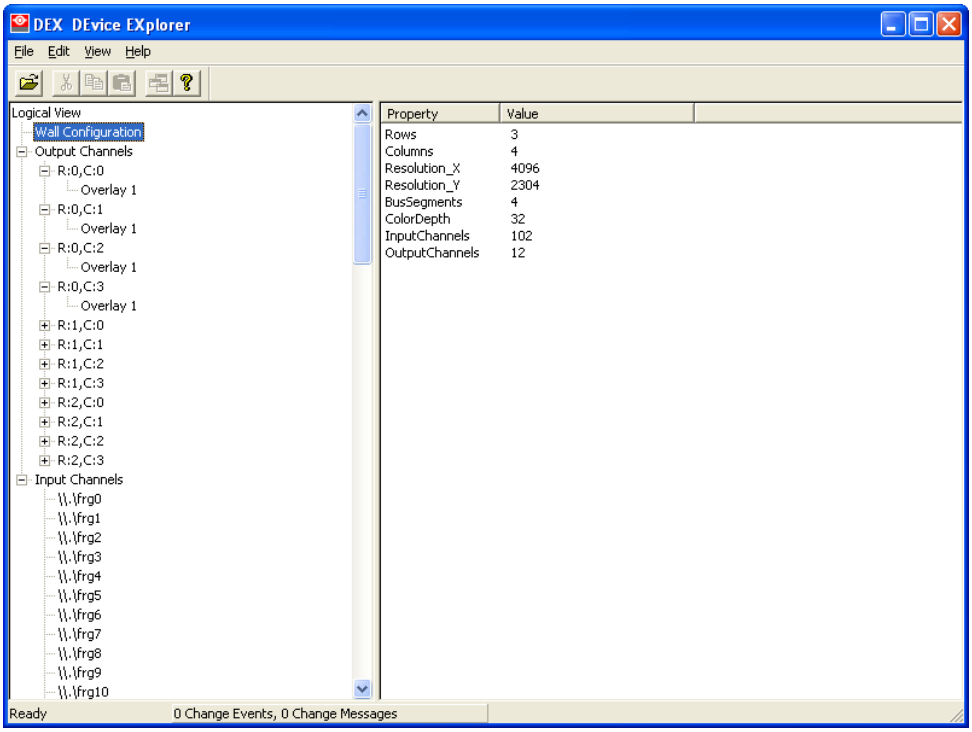


Figure 6-10
DEX in channel view mode

There exist three main entries: **Wall Configuration**, **Output Channels** and **Input Channels**.

Wall configuration provides a quick overview about the properties of the display wall. The table below lists these properties:

Property	meaning
Rows	number of rows of projection modules in the display wall
Columns	number of columns of projection modules in the display wall
Resolution_X	absolute number of pixels in horizontal direction
Resolution_Y	absolute number of pixels in vertical direction
BusSegments	OmniBus configuration: number of single PCI-Bus segments (also the PCI-Bus segment in the PROCESSOR is considered, therefore this number less 1 is the amount of used OMNIBUS devices)
	Processor configuration: always one PCI-Bus segment is indicated
ColorDepth	color depth used to operate the display wall
InputChannels	number of available input channels
OutputChannels	number of available output channels

Table 6-28
DEX - entries of wall properties

Output channels indicates the configuration and assignment of the channels of the graphic cards and OMNISCALERS according to the appearance of the data on the display wall. The names of the entries indicate the position on the display wall, where this graphic channel is displayed (please refer to the table below). If OMNISCALERS are used, then there is also a subentry available that shows the properties of the respective OMNISCALER channel.

Entry	meaning
Graphic card	
Row	Position on the display wall where the graphic channel is displayed: Row: counted from top to bottom, counting starts with 0. -1 is used, if the channel is not connected to the display wall.
Column	Column: counted from left to right, counting starts with 0. -1 is used, if the channel is not connected to the display wall.
GX_BoardType	Identifies the type of the graphic card by the first four digits of the ident number.
GX_BPIndex	Index of the OMNIBUS; counting starts with 1. *(only in an OmniBus conf.)*
GX_ConnectorPos	PCI slot used for this card, counting starts with 0.
GX_DevIndex	OmniBus configuration: Index of the graphic channel within one OMNIBUS Processor configuration: Index of the graphic channel system-wide. Counting starts with 0.
OMNISCALER	
BS_BoardType	Identifies the type of the OMNISCALER by the first four digits of the ident number.
BS_BPIndex	Index of the OMNIBUS; counting starts with 1. *(only in an OmniBus conf.)*
BS_ConnectorPos	PCI slot used for this card, counting starts with 0.
BS_DevIndex	OmniBus configuration: Index of the channel within one OMNIBUS Processor configuration: Index of the channel system-wide. Counting starts with 0.

Table 6-29
DEX - entries of output channels

Input channels lists all input channels available on the system without considering whether there is a signal applied or not. Per DUAL DVI INPUT CARD and DUAL RGB INPUT CARD there are two channels considered, for the other input cards there are 4 channels considered. The table below shows the entries available with an input channel and its meaning:

Entry	meaning
B_BoardType	Identifies the type of the base board of the input card by the first four digits of the ident number.
M_BoardType	Identifies the type of the mezzanine board of the input card by the first four digits of the ident number.
BPIndex	Index of the OMNIBUS; counting starts with 1. *(only in an OmniBus conf.)*
Connector Position	PCI slot used for this card, counting starts with 0.
DevIndex	OmniBus configuration: Index of the input channel within one OMNIBUS Processor configuration: Index of the input channel system-wide. One input card may provide multiple input channels depending on their type; counting starts with 0.
Name	Name of the input channel, default names are `\\frgX` where X is 0, 1, ...
Status	Status of the input channel, possible values are: `in use` / `free`
Bandwidth	Bandwidth that the input data currently requires on the PCI bus in Bytes/s

Table 6-30
DEX - entries of input channels

Import and Export of configuration data

To be able to remotely check configuration parameters and state of the TRANSFORM A the complete data available in DEX can be saved to files. These files can be sent e.g. to the customer service to examine the system. DEX is also used to view such saved files. For that purpose DEX cannot only be run from a TRANSFORM A, but can also be installed on any Windows 2000 or Windows XP computer.

To save data to a file, select first the desired view of the DEX (component view or logical view); then choose **File** from the menu and **Save As ...** . To store all available information both views must be saved one after the other.

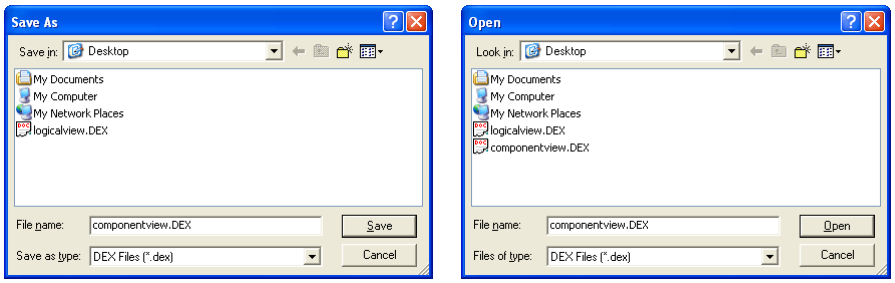


Figure 6-11
Save As and Open dialog of DEX

To load a saved configuration, choose **Open** from the menu and select the respective file.

When a file is displayed in DEX, then the location and name of the file is displayed in brackets in the title bar. It is not possible to switch between different views. Instead the file containing the desired view has to be opened.

To exit the file displaying mode of the DEX, select **New** from the **File** menu. This requests again the current values from the system and displays them.

Remote usage of DEX

To view DEX-files in locations where no TRANSFORM A is available, the DEX can also be used as a stand alone application on any other Windows 2000 or Windows XP computer.

Therefore insert the CD **TransForm A Suite CRS-3045-C** into the CD-ROM drive of that computer and browse to the directory of the current display driver suite `Windows Driver Suite X.X`:

```
<CDR-drive>:\Windows Driver Suite (OVS-2686)\Windows Driver Suite X.X
```

Execute the MIcrosoft Visual C++ 2008 redistributable package (x86) by a double click on `vcredist_x86.exe`. It installs runtime components of Visual C++ libraries required to run applications developed with Visual C++ on a computer that does not have Visual C++ 2008 installed.

Then browse to the subdirectory `i386` and copy the files `DEX.exe`, `MonLib.dll` and `FSCBMCAPI.dll` to the hard disk of that computer. Make sure that they are located in the same directory. Then DEX can also be started by a double click on that local copy.

6.1.14 Health monitoring

For efficient health monitoring the display driver suite provides a monitoring agent **MonAgent**. This is an SNMP agent that offers access to most properties that are listed via the DEX. In particular it provides three traps to notify from a failure of a redundant power supply, of a fan, or of a RAID hard disk.

As a standard SNMP Agent MonAgent allows to integrate TRANSFORM A systems with standard SNMP management systems. For sites where no SNMP monitoring is foreseen, especially the usage of traps of MonAgent provides efficient monitoring.

Installation

During the installation of the display driver the files required for the MonAgent are already copied to the hard disk of TRANSFORM A. They can be found under the following two paths:

`C:\Windows`	**`monagent.ini`**
`C:\windows\System32\`	**`monagent.exe`** **`monagent.mib`**

To install the agent open a command prompt and call `monagent.exe` with the option `-install`.

```
C:\Documents and Settings\<user>>monagent.exe -install
```

As soon as the command is executed a new service **MonAgent Service** is added to the services but not yet started.

Configuration

Before the agent can be used, two parameters must be adjusted in the `monagent.ini` file. Therefore open the file in a text editor and edit it according to your requirements.

```
[SNMP]
port=161
trap_destination=manager1/162,manager2/162
```

parameter	usage
port	TCP port where the MonAgent listens to requests of an SNMP manager
trap_destination	Specifies one or more SNMP manager: The syntax is **IP/port** or **computer name/port**. Multiple SNMP managers can be listed using a comma as separator, e.g.: `trap_destination=manager1/162,150.158.180.173/162`

Table 6-31
parameters of the monagent.ini file

You will also need the IP address of the TRANSFORM A and the port number specified under **port** to configure the SNMP manager accordingly.

Startup

To start the MonAgent service, open the services dialog (Start -> Settings –> Control Panel -> Administrative Tools -> Services). Open the Properties dialog with a right click on the MonAgent Service entry in the list. You can adjust the startup type to your requirements. To start the service, click the **Start** button.

Removing the service

When you want to remove the service from the list in the services dialog first stop the service and then open a command prompt and call `monagent.exe` with the option `-remove`.

```
C:\Documents and Settings\<user>>monagent.exe -remove
```

MIB and traps

The MIB is stored in the file `monagent.mib`. It lists the parameters that can be requested by the SNMP manager. These parameters serve to request information about the hard- and software of the TRANSFORM A system. In the MIB also three traps are defined to monitor the following components:

trap	meaning
monAgentTrapPower	one redundant power supply failed (is no longer in state OK)
monAgentTrapFan	a fan of the backplane failed
monAgentTrapRaid	a hard disk of the RAID has failed (is no longer in state OK)

Table 6-32
traps of MonAgent

Upgrade

When upgrading the display driver make sure to first stop the MonAgent service in the services dialog, otherwise the MonAgent will not be updated.

Even installations where no SNMP Management system is used, the health monitoring functionality of TransForm A can be used. For that purpose a sample configuration for the easy to set-up management tool HypericHQ can be made available on request.

6.1.15 RGB calibration tool

Analog RGB sources may suffer from differences in color due to the characteristics of the image generating unit and to signal disturbances caused by electromagnetic interference while the signal is transmitted in the cable.

The RGB calibration tool is used to analyze a test image that is inserted to the two channels of each DUAL DVI INPUT CARD and DUAL RGB INPUT CARD of the system and to store a calibration file for each card to compensate color abbreviations individually.

After performing the calibration procedure, all RGB input channels in the system should present their content in a homogeneous appearance even in distributed scenarios.

Required hard- and software

The following components are required for the RGB calibration:

- A notebook or computer acting as the RGB source, e.g. with a VGA output port to provide the test picture.
- Cables and adapters to connect the RGB source with a port of the DUAL DVI INPUT CARD and DUAL RGB INPUT CARD. This should be the original cables that are used for the regular sources as well, as the cables have an important influence on the calibration.
- The files `TestImage.exe` and `RgbCal.exe` from the display driver suite:
  `TestImage.exe` is used to display a defined test image on the external notebook or computer such that the desktop of this computer is able to act as calibration source for the DUAL DVI INPUT CARD and DUAL RGB INPUT CARD.
  `RgbCal.exe` is used on the TRANSFORM A whose RGB channels shall be calibrated.

Preparing the test image

Prepare the external computer to provide an RGB signal that contains the test image.

- Copy `TestImage.exe` to the computer acting as RGB source. The file is located on the CD **TransForm A Suite CRS-3045-C** in the `i386` directory of the current display driver suite `Windows Driver Suite X.X`:
  `<CDR-drive>:\Windows Driver Suite (OVS-2686)\Windows Driver Suite X.X\i386`
- Switch the resolution of the computer to 1024x768 pixels and the color depth to 32 bit.
- Start `TestImage.exe` with a double click on the file. The test picture appears at the upper left corner of the desktop as shown in the figure below:

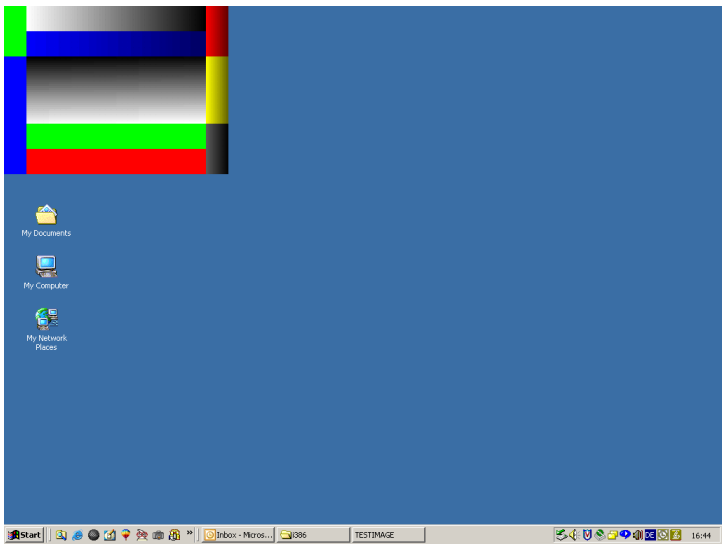


Figure 6-12
Test image on the external computer

- No further installation is necessary.

- On a notebook make sure that the graphics output is also provided on the VGA output.
- When calibration is done close the **TestImage** application by selecting it from the taskbar with a mouse click and then press the **F4** key while you keep the **ALT** key pressed. Readjust original resolution and color depth.

Do NOT overlay the test picture of the RGB source (on the external computer) with any other window.

Checking RGB presets

Check on all RGB channels, if the RGB signal of the external computer is displayed properly.

- Connect the RGB output of the computer acting as RGB source with the first channel of the first DUAL RGB INPUT CARDS or DUAL DVI INPUT CARDS.
- On the PROCESSOR run `video.exe` for that RGB channel to display the RGB signal with the test picture. Press the **F8** key to ensure that the video is shown without scaling or cropping.
- If the video window content is jittering adjust the RGB presets in the preset editor until the image is stable and the test picture is displayed at the upper left window corner of the window; please refer to section 4.3.10 Configuration of analog RGB and YUV input.
- Proceed like this for every RGB channel of the system.

Calibrating the RGB channels

- **Important:** Before starting the calibration close all instances of `video.exe` and APOLLO.
- You will have to connect the RGB signal with the test image to the RGB channels one after the other beginning with the lowest channel and considering the numbering used by `video.exe`. Therefore connect the lowest RGB channel.
- Start the application `RgbCal.exe` with a double click. It is located is located in the `System32` directory:
  `c:\Windows\System32\RgbCal.exe`
- `RgbCal.exe` starts up in a command prompt window. It continuously displays its current state. When it is ready to examine the first relevant channel it displays a line starting with `0000`. If the signal is not yet plugged to the respective channel, an increasing number of dots indicates that it is searching for the signal. As soon as the signal is found on that channel a video window showing the test picture pops up and the calibration procedure for that channel is executed. When the analysis is ready the result is displayed in the command prompt window and the video window showing the text picture will be removed again.
- As soon as the text `Remove test picture:` appears you can unplug the RGB signal and plug it to the next higher RGB channel. `RgbCal.exe` will detect it and continue without the need of interaction.
- Proceed like this untill all RGB channels are calibrated.
- If you want to skip an RGB channel for some reason, press **ESC** when the application searches for the signal.

Calibration Files

The created calibration files contain essentially the correction tables for ADC settings. In addition, they may contain some metadata, which is useful for error analysis. The name of a calibration file is composed of the prefix `RgbCal` and the serial number of the corresponding input card.

The serial number is stored in the IDPROM of the card, for more recent cards it is a 10 byte ASCII number and for other cards it is an 8 byte ASCII number, called the tracking serial number.

For example, `RgbCal00000017.cal` and `RgbCal9290022478.cal` are valid calibration file names. The calibration files are saved in the windows driver directory, usually `c:\windows\system32\drivers`.

Log Files

All messages in the console window of `RgbCal.exe` are also written to a human readable log file. The name of a log file is composed of the prefix `RgbCal` followed by its creation date and time.

For example, `RgbCal2008_01_24@11-49-36.log` is a valid log file name. The file has been created at 11:49:36 in 2008/01/24.

The log files are saved in the same directory like `RgbCal.exe`, usually `c:\windows\system32`.

Troubleshooting

`RgbCal.exe` accepts some command line parameters. To use them the application must be started directly from a command prompt. To get help information, describing these parameters, change to the directory `c:\Windows\System32\` and run the command:

`c:\Windows\System32\`**`RgbCal.exe /?`**

In case that the test picture will not be found frequently, it may help to increase the tolerance factor of the search algorithm. For that, the **color error** parameter `ce` may be increased by the command:

`RgbCal.exe /ce=<number>`

where `<number>` is the color error value in the range of `30..60`, default is `45`.

Error Messages

The following table lists the error messages possibly reported by `RgbCal.exe` in alphabetical order with some hints which may help to solve the problem.

message	meaning
Can't create unique filename	Fatal system error. Try again after reboot.
Can't create video window	Fatal system error. Try again after reboot.
Can't open device <dos device name>	Device already in use. Close all other video client applications.
Can't open MonLib (<status>)	Corrupted installation of the display driver suite. Reinstall it, check status code for a solution.
Can't show test picture	Fatal system error. Try again after reboot.
Canceled by user	One of the wait states aborted by the operator.
Error processing test picture (Calibration file)	Calibration file could not be written. Check disk space, log on as administrator.
Error processing test picture (Source change)	During the calibration the source signal got lost. Check the physical connection notebook – input card, cables and adapters.
Error processing test picture (Test picture)	Test picture not found. Check its presence, check preset settings, increase color error-value.
Error reading serial number	Board damaged or without valid IDPROM. Ask qualified personnel to repair or replace the board.
Invalid command line parameter <parameter>	Invalid command line parameter. Correct the parameter.
TFA Driver Version <version> or higher needed	Older version of display driver suite installed. Reinstall the indicated version or higher.

Table 6-33
Error messages of RgbCal.exe

Sample output window

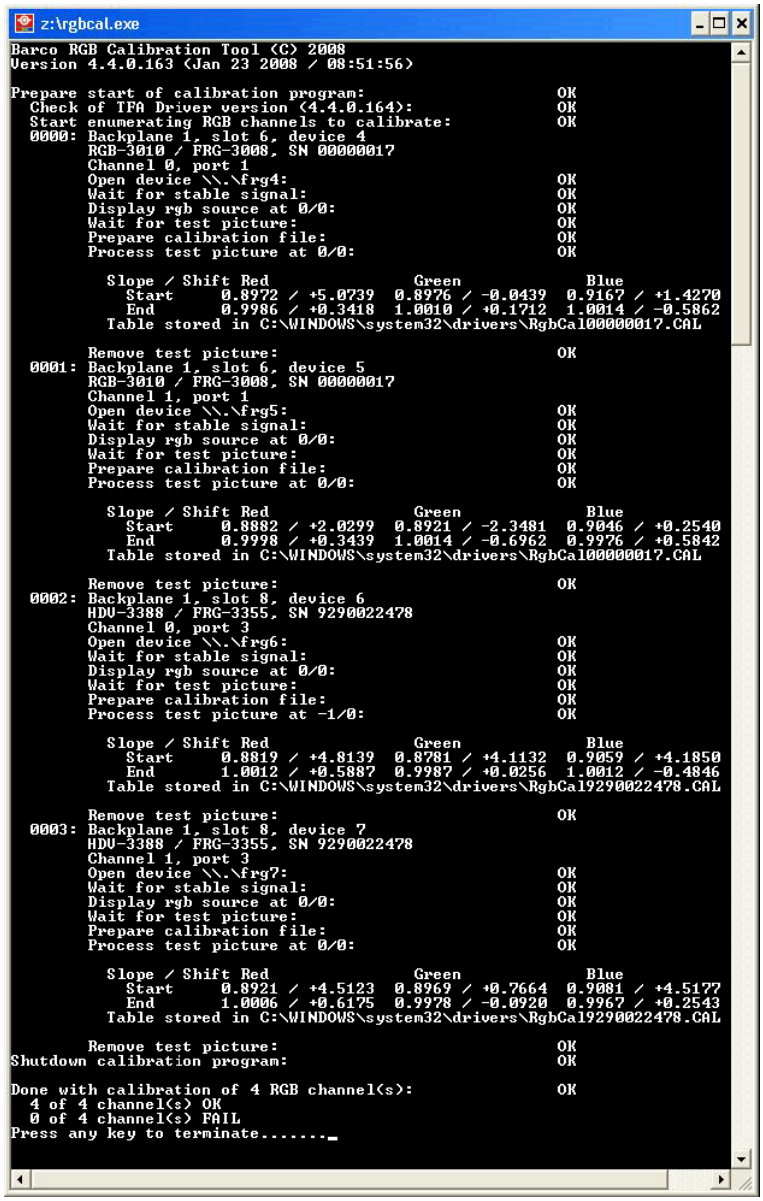


Figure 6-13
Sample output of the application

Sample log file

The content of the log file corresponds to the output of `RgbCal.exe` in the command prompt.

```
Barco RGB Calibration Tool (C) 2008
Version 4.4.0.168 (Mar 24 2008 / 12:45:34)

Prepare start of calibration program:                  OK
  Check of TFA Driver version (4.4.0.168):             OK
  Open RGB source enumerator:                          OK
  Create RGB video window:                             OK
  Start enumerating RGB channels to calibrate:         OK
  0000  RGB channel identification:                    OK
        Backplane 1, slot 6, device 4
        RGB-3010 / FRG-3008, SN 00000017
        Channel 0, port 1
        Open device \\.\frg4:                          OK
        Wait for stable signal:                        OK
        Display rgb source at 0/0:                     OK
        Wait for test picture (45):                    OK
        Prepare calibration file:                      OK
```

```
        Process test picture at 0/0:                    OK

          Slope / Shift Red              Green            Blue
            Start     0.8974 / +5.3479 0.8979 / +0.1979 0.9184 / +1.5165
            End       0.9989 / +0.3515 0.9979 / +0.3915 1.0026 / +0.4484
          Table stored in C:\WINDOWS\system32\drivers\RgbCal00000017.CAL

        Remove test picture:                            OK
  0001  RGB channel identification:                     OK
        Backplane 1, slot 6, device 5
        RGB-3010 / FRG-3008, SN 00000017
        Channel 1, port 1
        Open device \\.\frg5:                           OK
        Wait for stable signal:                         OK
        Display rgb source at 0/0:                      OK
        Wait for test picture (45):                     OK
        Prepare calibration file:                       OK
        Process test picture at 0/0:                    OK

          Slope / Shift Red              Green            Blue
            Start     0.8903 / +1.6824 0.8904 / -2.1235 0.9054 / +0.1912
            End       0.9993 / +0.5177 1.0007 / -0.2846 1.0015 / -0.4308
          Table stored in C:\WINDOWS\system32\drivers\RgbCal00000017.CAL

        Remove test picture:                            OK
  0002  RGB channel identification:                     OK
        Backplane 1, slot 8, device 6
        HDV-3388 / FRG-3355, SN 9290022478
        Channel 0, port 3
        Open device \\.\frg6:                           OK
        Wait for stable signal:                         OK
        Display rgb source at 0/0:                      OK
        Wait for test picture (45):                     OK
        Prepare calibration file:                       OK
        Process test picture at -1/0:                   OK

          Slope / Shift Red              Green            Blue
            Start     0.8820 / +4.6754 0.8767 / +4.2878 0.9056 / +4.1921
            End       1.0019 / +0.5022 0.9985 / -0.0498 0.9996 / +0.8051
          Table stored in C:\WINDOWS\system32\drivers\RgbCal9290022478.CAL

        Remove test picture:                            OK
  0003  RGB channel identification:                     OK
        Backplane 1, slot 8, device 7
        HDV-3388 / FRG-3355, SN 9290022478
        Channel 1, port 3
        Open device \\.\frg7:                           OK
        Wait for stable signal:                         OK
        Display rgb source at 0/0:                      OK
        Wait for test picture (45):                     OK
        Prepare calibration file:                       OK
        Process test picture at 0/0:                    OK
          Slope / Shift Red              Green            Blue
            Start     0.8918 / +4.5424 0.8957 / +0.9763 0.9086 / +4.4717
            End       1.0004 / +0.3867 1.0024 / -0.2515 0.9989 / +0.5703
          Table stored in C:\WINDOWS\system32\drivers\RgbCal9290022478.CAL
        Remove test picture:                            OK
Shutdown calibration program:                           OK
Done with calibration of 4 RGB channel(s):              OK
  4 of 4 channel(s) OK
  0 of 4 channel(s) FAIL
```

6.2 Advanced hardware configuration

6.2.1 Cascaded OmniScalers

To increase the amount of video sources that can be displayed on a given number of projection modules and that can be displayed freely movable, the cascaded OMNISCALER configuration can be used. This means that the output of the OMNISCALERS of one OMNIBUS is not connected to the projection modules but to the input connectors of another set of OMNISCALERS in another OMNIBUS. The data transmitted from the OMNISCALERS of the first OMNIBUS contains already the video information of the respective input cards. In the second OMNIBUS additional video data is added to the graphics data of the OMNISCALERS. OMNISCALERS of up to four OMNIBUS devices can be cascaded in this way.

QUAD ANALOG VIDEO CARD, DUAL RGB INPUT CARD, STREAMING VIDEO CARD, DUAL DVI INPUT CARD and QUAD SDI VIDEO CARD can be used in cascaded OMNISCALER configuration.

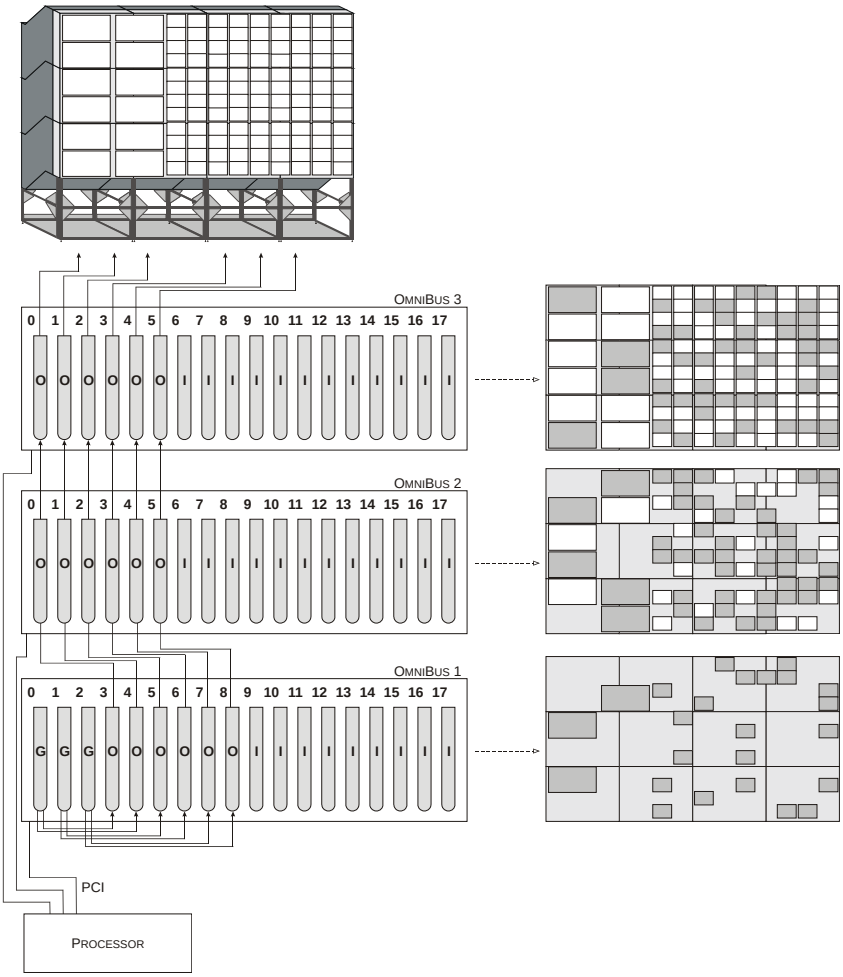


Figure 6-14
cascaded OMNISCALERS – way of working

The figure above shows on the left side the cabling for the cascading of the OMNISCALERS in three OMNIBUS devices and a possible result on the display wall. On the right hand side there is shown the current state of the graphical data as it would be shown on the display wall, if leaving out the following cascaded OMNISCALERS. Video windows added in that OMNIBUS are marked grey. Video windows which are already present from previous OMNIBUS devices are marked white.

System requirements

- OMNISCALERS need to be of the type **AGX-3313-0** or newer

Cabling and connection

Cabling as explained in the service manual applies with the following exceptions:

- The output connectors of the OMNISCALERS of one OMNIBUS are connected with the input connectors of OMNISCALERS of another OMNIBUS.
- Up to four OMNIBUS devices may be cascaded in this way.

Mode of operation

Once a system with cascaded OMNISCALERS is up and running, videos can be started and operated in the same way as on a standard system, please refer to section 4 Operating.

Distributed video may not be used with a cascaded OmniScaler setup!

6.2.2 Plain video mode

Alternatively to the standard configuration where always OMNISCALER are used to display video or RGB input data, this section describes a possibility to display video and RGB data in a system without OMNISCALERS. This is further referred as **plain video**.

Plain video is only recommended for systems where few video or RGB windows shall be shown, where those windows do not need to be upscaled and where genlocking is not required.

System requirements

For plain video mode the following system requirements have to be fulfilled:

Operating system	Windows XP
Windows driver suite	release 4.2 or higher
Hardware	UGX GRAPHIC CARD with QUAD ANALOG VIDEO CARDS, QUAD SDI VIDEO CARDS, STREAMING VIDEO CARDS, DUAL DVI INPUT CARDS and/or DUAL RGB INPUT CARDS

Table 6-34
System requirements for plain video

Software configuration

For plain video the following settings must be configured:

- The color depth of the system must be set to **Medium (16 bit)** (**Start -> Settings -> Control Panel -> Display -> Settings**)
- The cursor must be configured in any case as hardware mouse pointer, more information in section 3.6.1 Appropriate cursor for video applications.
- When starting the software video.exe, the option `/v` must be used with the value `1`, e.g.:
  ```
  video /d:frg0 /v:1
  ```
  Please refer also to section 4.3.1 Display in a window

Bandwidth considerations

Plain video is more restrictive towards bandwidth consumption. Therefore you should first check the feasibility of a configuration. Please check section 4.1.8 Amount of video and RGB windows for the principal understanding of the calculation of bandwidth consumption. The column **bandwidth per window [MBps]** of the Table 4-3 provides bandwidths of the most common content types; the proximate formula helps to check the feasibility of a configuration. The overall available bandwidth when using plain video mode can be assumed as given in the table below:

Device	Available bandwidth
OmniBus A12	120 MBps per OMNIBUS device
Processor AGS-3390-1/-2	120 MBps
Processor AGS-3389, AGS-3328	60 MBps

Table 6-35
Available average bandwidth with plain video

Hardware configuration

For best performance the plugging order of expansion cards in the OMNIBUS A12 should be considered. Cabling is explained in the service manual; anyhow for plain video mode the following exceptions should be made:

Having an OMNIBUS A12 with six or less expansion cards:

- Only the PCI slots with odd numbers are used.
- First the graphic cards are inserted in ascending order in each second PCI slot, beginning with the PCI slots with the lowest numbers at the very left (slot 1, 3, 5, ...)
- The input cards are inserted consecutively in the following slots with odd numbers (slot ..., 7, 9, ...)

Having an OMNIBUS A12 with seven up to twelve expansion cards:

- The expansion cards are inserted as described in the service manual with the only difference that the OMNISCALERS are omitted.

Respect the other general instructions for insertion of expansion cards given in the Service manual!

Make sure that any actions at the open device are carried out by qualified service personnel.

These rules are a suggestion for best performance for an OMNIBUS A12 in plain video mode. For special requirements also some subtle configurations might exist. In case of doubt contact the Barco support; please refer to section 8.3 Contact.

Functionality of video/RGB windows

Video windows of plain video behave the same way like standard video using OMNISCALERS, except for the following items:

- **Upscaling**
  Video data can only be displayed 1:1 or downscaled.
  Downscaled window content requires less bandwidth. Therefore only the actually displayed pixels must be considered when calculating the bandwidth.
  If anyhow the video window is dragged larger than 1:1, then the video itself will remain as 1:1 image centered in the window surrounded by black pixels.
- **Zooming, Cropping**
  Zooming and cropping is only useful as long as the video window is not larger than the standard size.
- **Pixel Format**
  The pixel format is by default 16 bit RGB.
  The **Scaler settings dialog box** cannot be displayed and the pixel format cannot be selected.
- If using multiple OMNIBUS A12 devices, a video can only be displayed on the projection modules that are connected to the graphic cards of that device that contains also the input card of that video.

Genlock is not supported with plain video.

7 Technical appendix

This chapter provides tabular overviews about the technical details of TRANSFORM A, its components and of their interfaces.

7.1 Technical data

Processor

dimensions (h/w/d)	177mm/440mm/516mm | 6.97 in./17.32 in./20.32 in. (**AGS-3328, AGS-3389**) 177mm/440mm/566mm | 6.97 in./17.32 in./22.28 in. (**AGS-3390-1/-2**)
dimensions (h/w/d) **with rubber feet, fixation, handling**	183mm/482mm/566mm | 7.20 in./18.98 in./22.28 in. (**AGS-3328, AGS-3389**) 183mm/482mm/616mm | 7.20 in./18.98 in./24.25 in. (**AGS-3390-1/-2**)
weight with standard power supply **weigth with redundant power supply**	18.0 kg | 39.7 lbs. (**AGS-3328-2, AGS-3389-2**) 20.5 kg | 45.2 lbs. (**AGS-3328-3, AGS-3389-3**) 22.3 kg | 49.2 lbs. (**AGS-3390-1/-2**)
power mains	100-240V, 60Hz/50Hz
power consumption **standard power supply** **redundant power supply**	 400 W (**AGS-3328-2, AGS-3389-2**) 400 W (**AGS-3328-3, AGS-3389-3**) / 650 W (**AGS-3390-1/-2**)
operating conditions	0 .. 40° Celsius at max. 80% humidity, non condensing

Table 7-1

OmniBus A12

dimensions (h/w/d)	177mm/440mm/450mm | 6.97 in./17.32 in./17.72 in.
dimensions (h/w/d) **with rubber feet, fixation, handling**	183mm/482mm/500mm | 7.20 in./18.98 in./19.69 in.
weight	18.2 kg | 40.1lbs.
power mains	100-240V, 60Hz/50Hz
power consumption	600 W
operating conditions	0 .. 40° Celsius at max. 80% humidity, non condensing

Table 7-2

OmniBus A18

dimensions (h/w/d)	267mm/449mm/420mm | 10.51 in./17.68 in./16.54 in.
dimensions (h/w/d) **with rubber feet, fixation, handling**	270mm/482mm/461mm | 10.63 in./18.98 in./18.15 in.
weight with standard power supply **weigth with redundant power supply**	19.8 kg | 43.7lbs. 21.8 kg | 48.1lbs.
power mains	100-240V, 60Hz/50Hz
power consumption	600 W
operating conditions	0 .. 40° Celsius at max. 80% humidity, non condensing

Table 7-3

Extender

dimensions (h/w/d)	177mm/440mm/450mm | 6.97 in./17.13 in./17.72 in.
dimensions (h/w/d) **with rubber feet, fixation, handling**	183mm/482mm/500mm | 7.20 in./18.98 in./19.76 in.
weigth	16.5 kg | 36.4lbs.
power mains	100-240V, 60Hz/50Hz
power consumption	400 W
operating conditions	0° .. 40° C at max. 80% humidity, non condensing
Interfaces	13 PCI slots for expansion cards 1 slot for connecting to the PROCESSOR

Table 7-4

UGX Graphic Card

graphic accelerator	4×Radeon 7500 with 4×32 MB RAM
local CPU	64-bit RISC processor with 64 MB SDRAM
resolution & colors (analog)	8bpp, 15 bpp, 16 bpp, 24 bpp, 32 bpp
640×480	85 Hz
800×600	85 Hz
1024×768	85 Hz
1280×960	85 Hz
1280×1024	85 Hz
1600×1200	85 Hz
1920×1440	60 Hz
resolution & colors (digital)	8 bpp, 15 bpp, 16 bpp, 32 bpp up to 1920x1080@60Hz or 1920x1200@50Hz
video output stage	pixel clock digital 165 MHz, pixel clock analog max. 350 MHz
bus connection	PCI bus, 32bit / 33 MHz, 64bit / 66 MHz
supply voltage	5 V (±5%), 3.3 V (±0.3 V)
current consumption	5 V / max. 2.5 A, 3.3 V / max. 1.6 A
operating conditions	0 .. 50° C at 8% - 80% humidity, non-condensing
dimensions	PCI long card 312.00 mm × 121.92 mm with ISA retainer and front plate 352.18 mm ×121.92 mm
weight	280 g
plugs	1 64/32bit, Dual Voltage Signaling PCI edge connector 2 Dual-DVI connector

Table 7-5

OmniScaler

video/RGB input format	YUV4:2:2, XRGB8:8:8:8, RGB8:8:8, RGB5:6:5
data input format	24 bpp PanelLink
data output format	24 bpp PanelLink in the resolution and timing of the input up to 1280×1024 AGX-3002 up to 1920×1200 AGX-3313
video source RAM	64 MB DDR SDRAM, 64 bit
bus connection	PCI bus, 32bit / 33 MHz, 64bit / 66 MHz
supply voltage	5 V (±5%), 3.3 V (±5%)
current consumption	5 V / 3.0 A, 3.3 V / 1.4 A
operating conditions	0 .. 50° C at 8% - 80% humidity, non-condensing
dimensions	PCI long card 312.00 mm × 121.92 mm with ISA retainer and front plate 352.18 mm ×121.92 mm
weight	250 g
plugs	1 64/32bit, Dual Voltage Signaling PCI edge connector 1 Dual-DVI connector in, 1 Dual-DVI connector out

Table 7-6

Streaming Video Card SVC-1

scaler	via scaler algorithm in FPGA for 1:1 or downscaling	
CPU-/Frame-Memory	64MB SDRAM	
digital network carrier	Base–T Ethernet 10/100Mbps	
compression algorithm	MPEG-1 MPEG-2 DVB MPEG-4 part 2 Bosch MPEG-4 (h263) MJPEG MXPEG 2D Wavelet	ISO 11172 ISO 13818 (MP@ML 4:2:0) ETR 154 / SPTS / MPTS (the DVB format is MPEG-2 based) ISO 14496-2 (SP@L3, ASP@L5) ISO 10918
video formats	PAL, NTSC	
bitrate	1 - 4 streams and max. 44Mbps per board	
	MPEG-1:	up to 4 streams (all resolutions)
	MPEG-2:	up to 4 D1 streams or 4 CIF streams, 44Mbps per board, max. 15Mbps per stream
	MPEG-4 part 2:	up to 4 CIF streams or 3 2CIF streams or 1-2 4CIF streams, depends on resolution 32Mbps per board, max. 8Mbps per stream
	MPEG-4 h263:	up to 4 CIF streams or 4 2CIF streams or 4 4CIF streams
	MJPEG:	up to 4 CIF streams or 2-4 4CIF streams
	MxPEG:	up to 4 CIF streams or 2 1280x576 streams
	Visiowave:	1-3 D1 streams or up to 4 CIF streams, depends on resolution
	TRANSFORM SCN:	1 stream
supported encoders	MPEG-2:	Bosch, Coretec, Cornet, Exterity, Fast Video Security, HaiVision, iMPath, Lanaccess, Mavix, NKF, NiceVision, Optelecom, Optibase, Path1, PelcoNET, Siemens OTN, Tandberg, Teleste, Telindus, VBrick, VideoLAN, Vorx
	MPEG-4 part 2:	Cieffe, Cornet, DVTeL, Hi Tron, IndigoVision, Lanaccess, Mavix, NiceVision, Siemens OTN, Teleste, VBrick, Verint, VideoLAN, Vorx
	MPEG-4 h263:	Bosch, PelcoNET
	MJPEG:	AXIS, JVC, Lenel, VideoLAN
	MXPEG:	Mobotix
	2D Wavelet:	GE Security, Visiowave
	TRANSFORM SCN:	Barco
network transmission protocol	UDP	
	RTP (variable header length, lost packet detection, non-video packet detection)	
connection protocols	IGMP v2 and v3 (multicast subscription)	
colors	internal data path YUV 4:2:2 (16 bit wide)	
bus	PCI bus, 32bit / 33 MHz, 64bit / 66 MHz	
power supply	5 V (±2%), 3.3 V (±0.3 V)	
power consumption	5 V / 2.2 A, 3.3 V / 3.4 A	
operating conditions	0 .. 50° C at 8 - 80% humidity, non-condensing	
dimensions	PCI long-card, 312.00 mm x 121.92 mm	
Weight	480 g	
connectors	1 x 64 bit, 3.3 V/5 V PCI edge connector 2 × RJ45 connector 8-pin for redundant connection	

Table 7-7

Streaming Video Card SVC-2

scaler	via scaler algorithm in FPGA for 1:1 or downscaling
digital network carrier	Base–T Ethernet 10/100/1000Mbps
compression algorithm	MPEG-2 ISO 13818 (MP@ML 4:2:0) MPEG-4 part 2 ISO 14496-2 (ASP@L5) Visiowave
video formats	PAL, NTSC
bitrate	1 - 4 streams per board, stream resolution up to 4CIF or D1: MPEG-2: up to 15Mbps per stream MPEG-4 part 2: up to 8Mbps per stream
supported encoders	MPEG-2: iMPath, NKF MPEG-4 part 2: Acti, Axis, Cieffe, Coe, Coretec, Cornet, Hisome, Mavix, NKF, Teleste, Vbrick, Verint, VideoBridge Visiowave: VisioWave
network transmission protocol	UDP RTP / RTCP and RTSP
connection protocols	IGMP v3
colors	internal data path YUV 4:2:2 (16 bit wide)
bus	PCI bus, 32bit / 33 MHz, 64bit / 66 MHz
power supply	5 V (±2%), 3.3 V (±0.3 V)
power consumption	5 V / 2.7 A, 3.3 V / 3.9 A
operating conditions	0 .. 50° C at 8 - 80% humidity, non-condensing
dimensions	PCI long-card, 312.00 mm x 121.92 mm
Weight	500 g
connectors	1 × 64 bit, 3.3 V/5 V PCI edge connector 2 × RJ45 connector 8-pin for redundant connection

Table 7-8

Quad Analog Video Card

video-decoder	4 x SAA7118E
de-interlacer	Median filter FPGA
scaler	via scaler algorithm in FPGA for 1:1 or downscaling
CPU-/Frame-Memory	64MB SDRAM
input formats	CVBS PAL B, D, G, H, I, N NTSC M, N, 4.43 SECAM
colors	internal data path YUV 4:2:2 (16 bit wide)
video standard	ITU-R601 and ITU-R656 compatible
bus	PCI bus, 64 bit, 3.3/5 V, max, 66 MHz
power supply	5 V (±2%), 3.3 V (±0.3 V), 12 V (±10%), -12 V (±10%)
power consumption	5 V / 0.8 A, 3.3 V / 2.5 A
operating conditions	0 .. 50° C at 8 – 80% humidity, non-condensing
dimensions	PCI long-card, 312.00 mm x 121.92 mm
weight	425 g
connectors	1 × 64 bit, 3.3 V/5 V PCI edge connector 4 × BNC connector

Table 7-9

Quad SDI Video Card

scaler	via scaler algorithm in FPGA for 1:1 or downscaling
CPU-/Frame-Memory	64MB SDRAM
input formats	NTSC 4:2:2 component 13.5MHz Y sampling PAL 4:2:2 component 13.5MHz Y sampling
colors	internal data path YUV 4:2:2 (16 bit wide)
video standard	SMPTE 259M-C (270Mbps, 4:2:2) compliant
bus	PCI bus, 32bit / 33 MHz, 64bit / 66 MHz
power supply	5 V (±2%), 3.3 V (±0.3 V), 12 V (±10%), -12 V (±10%)
power consumption	5 V / 1.9 A, 3.3 V / 1.8 A, -12 V / 20 mA
operating conditions	0 .. 50° C at 8 - 80% humidity, non-condensing
dimensions	PCI long-card, 312.00 mm x 121.92 mm
connectors	1 x 64 bit, 3.3 V/5 V PCI edge connector 4 x BNC, 1 x RJ45 connector 10-pins (not used)

Table 7-10

Dual DVI Input Card

A/D converter	2 x Analog Devices AD9888
scaler	via scaler algorithm in FPGA for 1:1 or downscaling
CPU-/Frame-Memory	64MB SDRAM
input	Dual input mode (up to HDTV 1920×1080@60 Hz / input): analog input: Pixel clock up to 170 MHz / input digital input: Pixel clock up to ca. 288 MHz / input (depending on the signal) Single input mode (up to 2048×2048@60 Hz): analog input: Pixel clock up to 340 MHz digital input: Pixel clock up to 330 MHz Hsync+Vsync, Csync, Sync-on-Green Sync level 1 V – 5 V / TTL
colors	15 bpp / 32K, 16 bpp / 64K, 24 bpp / 16M
input formats	SDTV analog Composite, S-video HDTV analog and digital YPrPb, YCrCb, RGB RGB analog and digital
bus	PCI bus, 32bit / 33 MHz, 64bit / 66 MHz
power supply	5 V (±2%), 3.3 V (±0.3 V), 12 V (±10%), -12 V (±10%)
power consumption	5 V / 2.8 A, 3.3 V / 3.5 A, -12 V / 100 mA
operating conditions	0 .. 50° C at 8% - 80% humidity, non-condensing
dimensions	PCI long-card, 312.00 mm x 121.92 mm
weight	208 g
connectors	1 × 64 bit, 3,3/5 V PCI edge connector 1 × DVI-I dual link connector 1 × DVI-I connector

Table 7-11

Streaming Video Card J2K

scaler	via scaler algorithm in FPGA for 1:1 or downscaling
CPU-/Frame-Memory	64MB SDRAM
digital network carrier	video network: Base–T Ethernet 100/1000Mbps control network: Base–T Ethernet 10/100Mbps
compression algorithm	JPEG2000
video formats	PAL, NTSC progressive scan ADV202 RAW bit-stream packetized in RTP/IP-Packets
bitrate	1 - 4 streams per board, up to 100Mbps per stream or up to 800Mbps per board stream resolution up to SD 720×576p
supported encoders	Barco NGS-101
network transmission protocol	RTP
connection protocols	IGMP v2 and v3 (multicast subscription)
colors	internal data path YUV 4:2:2 (16 bit wide)
bus	PCI bus, 32bit / 33 MHz, 64bit / 66 MHz
power supply	5 V (±2%), 3.3 V (±0.3 V)
operating conditions	0 .. 50° C at 8 - 80% humidity, non-condensing
dimensions	PCI long-card, 312.00 mm x 121.92 mm
Weight	515 g
connectors	1 x 64 bit, 3.3 V/5 V PCI edge connector 4 × RJ45 connector 8-pin for redundant connection of two nets

Table 7-12

Dual RGB Input Card

A/D converter	2 x Analog Devices AD9888	
scaler	via scaler algorithm in FPGA for 1:1 or downscaling	
CPU-/Frame-Memory	64MB SDRAM	
input	up to SXGA 1280×1024@75 Hz / input: Pixel clock 20 MHz – 135 MHz / input Line frequency 15 kHz – 115 kHz / input Hsync+Vsync, Csync, Sync-on-Green Sync level 1 V – 5 V / TTL	
colors	15 bpp / 32K, 16 bpp / 64K, 24 bpp / 16M	
internal frame rate		
input timing:	**max. frame rate with internal color depth of 16 bpp and 24 bpp**	
	dual input mode **(also other combinations, if considering pixel clock and line frequency requirements):**	
1280x1024@60Hz and textmode@70Hz	**2 x 30Hz at 16 bpp**	**2 × 20Hz at 24 bpp**
2 x 1280x1024@60Hz	**2 x 30Hz at 16 bpp**	**2 x 20Hz at 24 bpp**
2 x 1280x1024@75Hz	**2 x 37Hz at 16 bpp**	**2 x 25Hz at 24 bpp**
bus	PCI bus, 32bit / 33 MHz, 64bit / 66 MHz	
power supply	5 V (±2%), 3.3 V (±0.3 V), -12 V (±10%)	
power consumption	5 V / 1.5 A, 3.3 V / 1.6 A, -12 V / 100 mA	
operating conditions	0 .. 50° C at 8% - 80% humidity, non-condensing	
dimensions	PCI long-card, 312.00 mm x 121.92 mm	
weight	425 g	
connectors	1 x 64 bit, 3,3/5 V PCI edge connector 2 x 15-pin SubMinD HD connector, VGA compatible	

Table 7-13

Presets of Dual RGB Input Card and Dual DVI Input Card

Default presets (file: **rgb3010.prs**)

Presets for RGB input with DUAL RGB INPUT CARD or DUAL DVI INPUT CARD:

	PLL_DIVIDER	H_SIZE	V_TOT	V_SIZE	V_PERIOD	V_POS	H_POS	H_POL	V_POL	SYNC_MODE	ADC_PHASE
[640x350@70Hz]	800	640	449	350	14285	60	137	1	1		16
[640x350@85Hz]	832	640	445	350	11764	63	160	0	1		16
[640x400@70Hz]	800	640	450	400	14285	35	137	1	1		16
[640x400@85Hz]	832	640	445	400	11764	44	160	1	0		16
[640x480@60Hz]	800	640	525	480	16666	35	144	1	1		24
[640x480@72Hz]	832	640	520	480	13888	31	168	1	1		24
[640x480@75Hz]	840	640	500	480	13333	19	184	1	1		8
[640x480@85Hz]	832	640	509	480	11764	28	136	1	1		24
[720x400@70Hz]	900	720	449	400	14285	36	154	1	0		16
[720x400@85Hz]	936	720	446	400	11764	45	180	1	0		16
[800x600@56Hz]	1024	800	625	600	17857	24	200	0	0		24
[800x600@60Hz]	1056	800	628	600	16666	27	216	0	0		16
[800x600@72Hz]	1040	800	666	600	13888	29	184	0	0		12
[800x600@75Hz]	1056	800	625	600	13333	24	240	0	0		16
[800x600@85Hz]	1048	800	631	600	11764	30	216	0	0		16
[1024x768@43Hz]	1264	1024	817	768	23256	24	232	0	0		16
[1024x768@60Hz]	1344	1024	806	768	16666	35	296	1	1		8
[1024x768@70Hz]	1328	1024	806	768	14285	35	280	1	1		8
[1024x768@75Hz]	1312	1024	800	768	13333	31	272	0	0		8
[1024x768@85Hz]	1376	1024	808	768	11764	39	304	0	0		
[1152x864@60Hz]	1520	1152	895	864	16666	31	282	1	0		1
[1152x864@70Hz]	1536	1152	900	864	14286	36	287	1	0		3
[1152x864@75Hz]	1600	1152	900	864	13333	35	384	0	0		22
[1152x864@85Hz]	1552	1152	907	864	11765	43	297	1	0		6
[1152x900@66Hz]	1504	1152	937	900	15152	31	311	0	1	1	1
[1152x900@76Hz]	1464	1152	943	900	13158	33	278	0	1	1	28
[1280x768@60Hz]	1712	1280	994	768	16670	129	327	1	0	0	1
[1280x768@75Hz]	1712	1280	802	768	13333	34	324	1	0		22
[1280x768@85Hz]	1728	1280	807	768	11765	39	328	1	0		15
[1280x800@60Hz]	1712	1280	994	800	16670	113	327	1	0	0	1
[1280x900@70Hz]	1800	1280	1000	960	14286	40	408	0	0		
[1280x960@60Hz]	1800	1280	1000	960	16666	39	424	0	0		22
[1280x960@70Hz]	1728	1280	999	960	14286	39	329	1	0		5
[1280x960@75Hz]	1686	1280	1000	960	13333	39	386	0	0		
[1280x960@85Hz]	1728	1280	1011	960	11764	50	384	0	0		

	PLL_DIVIDER	H_SIZE	V_TOT	V_SIZE	V_PERIOD	V_POS	H_POS	H_POL	V_POL	SYNC_MODE	ADC_PHASE
[1280x1024@60Hz]	1688	1280	1066	1024	16666	41	360	0	0		22
[1280x1024@70Hz]	1728	1280	1066	1024	14286	42	326	1	0		26
[1280x1024@75Hz]	1688	1280	1066	1024	13333	31	392	0	0		8
[1280x1024@85Hz]	1728	1280	1072	1024	11764	47	384	0	0		10
[1400x1050@60Hz]	1875	1400	1087	1050	16630	36	391	0	0		4
[1400x1050@70Hz]	1793	1400	1067	1050	14286	17	359	1	1		8
[1600x1200@60Hz]	2160	1600	1250	1200	16666	49	496	0	0		
[1600x1200@65Hz]	2160	1600	1250	1200	15384	49	496	0	0		
[1600x1200@70Hz]	2160	1600	1250	1200	14285	49	496	0	0		
[1600x1200@75Hz]	2160	1600	1250	1200	13333	49	496	0	0		
[1600x1200@85Hz]	2160	1600	1250	1200	11764	49	496	0	0		
[1680x1050@60Hz]	2272	1680	1304	1050	16666	148	479	0	0		
[1792x1344@60Hz]	2448	1792	1394	1344	16666	49	528	1	0		
[1792x1344@75Hz]	2456	1792	1417	1344	13333	72	568	1	0		
[1792x1344@85Hz]	2464	1792	1411	1344	11765	67	462	1	0		2
[1800x1440@60Hz]	2456	1800	1490	1440	16666	50	474	1	0		15
[1800x1440@70Hz]	2472	1800	1499	1440	14286	59	471	1	0		15
[1800x1440@75Hz]	2472	1800	1503	1440	13333	63	466	1	0		15
[1856x1392@60Hz]	2528	1856	1439	1392	16666	47	522	1	0		4
[1856x1392@72Hz]	2544	1856	1450	1392	13888	58	478	1	0		15
[1856x1392@75Hz]	2560	1856	1500	1392	13333	107	576	1	0		
[1920x1080@60Hz]	2576	1920	1118	1080	16666	38	494	1	0		11
[1920x1080@75Hz]	2608	1920	1128	1080	13333	48	498	1	0		6
[1920x1200@60Hz]	2592	1920	1242	1200	16666	42	496	1	0		9
[1920x1200@75Hz]	2624	1920	1253	1200	13333	53	499	1	0		6
[1920x1200@85Hz]	2640	1920	1260	1200	11765	60	497	1	0		1
[1920x1440@60Hz]	2600	1920	1500	1440	16666	59	552	1	0		
[1920x1440@75Hz]	2640	1920	1500	1440	13333	60	502	1	0		1
[2048x1536@45Hz]	2804	2048	1600	1536	22222	63	600	1	1		
[2048x1536@60Hz]	2800	2048	1589	1536	16680	53	534	1	0		8
[2048x1536@66Hz]	2816	2048	1595	1536	15152	59	534	1	0		6
[2048x2048@45Hz]	2804	2048	2114	2046	22222	59	709	1	1		

Table 7-14

Presets for component formats YUV with DUAL DVI INPUT CARD:

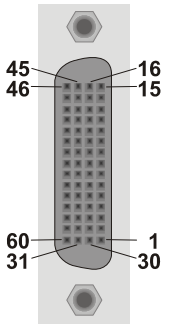
	PLL_DIVIDER	H_SIZE	V_TOT	V_SIZE	V_PERIOD	V_POS	H_POS	H_POL	V_POL	SYNC_MODE	ADC_PHASE	SOG_LEVEL	HV_LEVEL
[720x480@30i]	864	720	525	480	33350	35	145	0	1	1	25	15	127
[720x480@60p]	880	720	525	480	16670	37	142	0	1	1	22	15	127
[720x576@25i]	872	720	625	576	39990	41	156	0	1	1	0	15	127
[720x576@50p]	896	720	625	576	19990	43	156	0	1	1	22	15	127
[1280x720@50p]	1984	1280	750	720	19980	22	264	0	1	1	8	15	127
[1280x720@60p]	1704	1280	750	720	16670	22	292	0	1	1	22	15	127
[1920x1080@25i]	2664	1920	1125	1080	39980	34	204	0	1	1	22	15	127
[1920x1080@30i]	2240	1920	1125	1080	33350	36	217	0	1	1	22	15	127

Table 7-15

7.2 Interfaces

Seen from outside TransForm A.

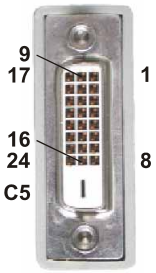
UGX Graphic Card, digital and analog out



46	GND (shield, return for +5V, Hsync and Vsync)	**45**	0 - Data1+	**16**	0 - Data0+	**15**	GND
47	0 - green	**44**	0 - Data1-	**17**	0 - Data0-	**14**	0 - red
48		**43**	0 - Clock+	**18**	0 - Data2+	**13**	0 - blue
49	GND	**42**	0 - Clock-	**19**	0 - Data2-	**12**	GND
50	0 - Hsync	**41**		**20**		**11**	0 - +5V Power
51	0 - Vsync	**40**	0 - Hot Plug detect	**21**		**10**	0 - DDC clock
52	GND	**39**	0 - LED PGA	**22**		**9**	0 - DDC data
53		**38**	Scaler detect	**23**	Int Scaler	**8**	GND
54	GND	**37**	1 - LED PGA	**24**		**7**	1 - DDC data
55	1 - Vsync	**36**	1 - Hot Plug detect	**25**		**6**	1 - DDC clock
56	1 - Hsync	**35**		**26**		**5**	1 - +5V Power
57	GND	**34**	1 - Clock-	**27**	1 - Data2-	**4**	GND
58		**33**	1 - Clock+	**28**	1 - Data2+	**3**	1 - blue
59	1 - green	**32**	1 - Data1-	**29**	1 - Data0-	**2**	1 - red
60	GND	**31**	1 - Data1+	**30**	1 - Data0+	**1**	GND

Figure 7-1
Dual-DVI connector digital/analog out

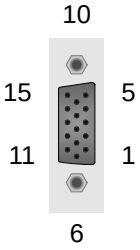
Dual-DVI to 2xDVI-D adapter cable



17	Data0-	**9**	Data1-	**1**	Data2-
18	Data0+	**10**	Data1+	**2**	Data2+
19	Data0 Shield	**11**	Data1 Shield	**3**	Data2 Shield
20		**12**		**4**	
21		**13**		**5**	
22	Clock Shield	**14**	+5V Power	**6**	DDC Clock
23	Clock+	**15**	Ground (return for +5V)	**7**	DDC Data
24	Clock-	**16**	Hot Plug Detect	**8**	
		C5			

Figure 7-2
DVI-D connector

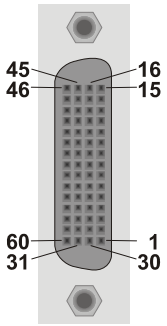
Dual-DVI to 2xCRT adapter cable



1	red	**6**	red GND	**11**	
2	green	**7**	green GND	**12**	DDC data
3	blue	**8**	blue GND	**13**	Hsync
4		**9**	+5V Power	**14**	Vsync
5	GND	**10**	GND	**15**	DDC clock

Figure 7-3
CRT connector

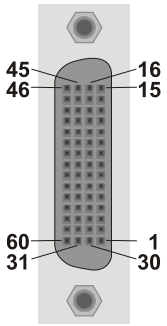
OmniScaler digital in



46	GND (shield, return for +5V)	**45**	1 - Data1+	**16**	1 - Data0+	**15**	GND
47		**44**	1 - Data1-	**17**	1 - Data0-	**14**	
48		**43**	1 - Clock+	**18**	1 - Data2+	**13**	
49	GND	**42**	1 - Clock-	**19**	1 - Data2-	**12**	GND
50		**41**		**20**		**11**	
51		**40**	1 - Hot Plug detect	**21**		**10**	1 - DDC clock
52	GND	**39**	1 - LED PGA	**22**		**9**	1 - DDC data
53		**38**	Scaler detect	**23**	Int Scaler	**8**	GND
54	GND	**37**	0 - LED PGA	**24**		**7**	0 - DDC data
55		**36**	0 - Hot Plug detect	**25**		**6**	0 - DDC clock
56		**35**		**26**		**5**	
57	GND	**34**	0 - Clock-	**27**	0 - Data2-	**4**	GND
58		**33**	0 - Clock+	**28**	0 - Data2+	**3**	
59		**32**	0 - Data1-	**29**	0 - Data0-	**2**	
60	GND	**31**	0 - Data1+	**30**	0 - Data0+	**1**	GND

Table 7-16
Dual-DVI connector digital in

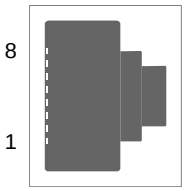
OmniScaler digital out



46	GND (shield, return for +5V, Hsync and Vsync)	**45**	0 - Data1+	**16**	0 - Data0+	**15**	GND
47		**44**	0 - Data1-	**17**	0 - Data0-	**14**	
48		**43**	0 - Clock+	**18**	0 - Data2+	**13**	
49	GND	**42**	0 - Clock-	**19**	0 - Data2-	**12**	GND
50		**41**		**20**		**11**	0 - +5V Power
51		**40**	0 - Hot Plug detect	**21**		**10**	0 - DDC clock
52	GND	**39**	0 - LED PGA	**22**		**9**	0 - DDC data
53		**38**	Scaler detect	**23**	Int Scaler	**8**	GND
54	GND	**37**	1 - LED PGA	**24**		**7**	1 - DDC data
55		**36**	1 - Hot Plug detect	**25**		**6**	1 - DDC clock
56		**35**		**26**		**5**	1 - +5V Power
57	GND	**34**	1 - Clock-	**27**	1 - Data2-	**4**	GND
58		**33**	1 - Clock+	**28**	1 - Data2+	**3**	
59		**32**	1 - Data1-	**29**	1 - Data0-	**2**	
60	GND	**31**	1 - Data1+	**30**	1 - Data0+	**1**	GND

Figure 7-4
Dual-DVI connector digital out

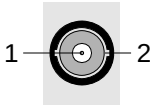
Streaming Video Card



1	TD+	**5**	
2	TD-	**6**	RD-
3	RD+	**7**	
4		**8**	

Figure 7-5
RJ-45 connector, Streaming video card

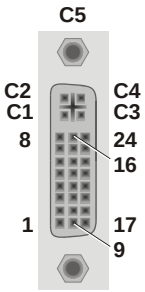
Quad SDI Video Card or Quad Analog Video Card



1	Signal
2	Shield

Figure 7-6
BNC connector, QUAD SDI VIDEO CARD or QUAD ANALOG VIDEO CARD

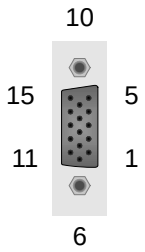
Dual DVI Input Card



C2	Analog Green	**C5**	Analog Ground (analog R, G, & B return)	**C4**	Analog HSync
C1	Analog Red			**C3**	Analog Blue
8	Analog VSync	**16**	Hot Plug Detect	**24**	TMDS Clock-
7	DDC Data	**15**	Ground (return for +5V, Hsync, and Vsync)	**23**	TMDS Clock+
6	DDC Clock	**14**	+5V	**22**	TMDS Clock Shield
5	TMDS Data4+ [1)]	**13**	TMDS Data3+ [1)]	**21**	TMDS Data5+ [1)]
4	TMDS Data4- [1)]	**12**	TMDS Data3- [1)]	**20**	TMDS Data5- [1)]
3	TMDS Data2, 4 shield	**11**	TMDS Data1, 3 shield	**19**	TMDS Data0, 5 shield
2	TMDS Data2+	**10**	TMDS Data1+	**18**	TMDS Data0+
1	TMDS Data2-	**9**	TMDS Data1-	**17**	TMDS Data0-

Figure 7-7
DVI-I connector
1) Dual link pins 4, 5, 12, 13, 20, 21 only connected at In1

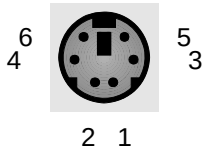
Dual RGB Input Card in



1	red	**6**	red GND	**11**	
2	green	**7**	green GND	**12**	
3	blue	**8**	blue GND	**13**	H/C SYNC
4		**9**		**14**	VSYNC
5	sync GND	**10**	sync GND	**15**	

Figure 7-8

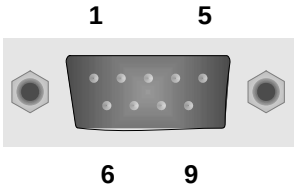
PS/2 keyboard and PS/2 mouse



1	data	**4**	+5V
2		**5**	clock
3	GND	**6**	

Figure 7-9

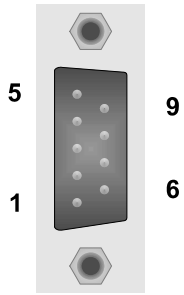
COM1



1	DCD	**6**	DSR
2	RxD	**7**	RTS
3	TxD	**8**	CTS
4	DTR	**9**	RI
5	GND		

Figure 7-10

Multiport I/O card

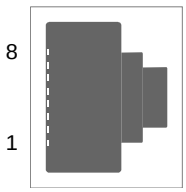


1	DCD	**6**	DSR
2	RxD	**7**	RTS
3	TxD	**8**	CTS
4	DTR	**9**	RI
5	GND		

Figure 7-11
serial connector pin assignment

Network card and onboard LAN adapter

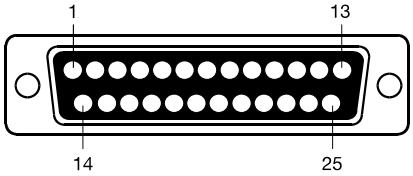
For complete cabling details, please refer to the **IEEE802.3** specification, section 8.4, **Coaxial Cables and Electrical Parameters**.



1	TD+	**5**	
2	TD–	**6**	RD–
3	RD+	**7**	
4		**8**	

Figure 7-12
RJ-45 connector pin assignments

Connection cable (keyboard extension)



Plug 1	twisted pairs	Plug 2
1	1 and 14	**1**
2	2 and 15	**2**
3	3 and 16	**3**
	etc.	
13	–	**13**
	etc.	
23	23 and 10	**23**
24	24 and 11	**24**
25	25 and 12	**25**
Shield connected to plug housing Ferrit		Shield connected to plug housing Ferrit

Figure 7-13

7.3 Order codes

Documentation	
DOC-3266-2	user's manual TRANSFORM A – Workstation for Windows, English
Hardware	
AGS-3328-2	PROCESSOR, Pentium IV 3.4 GHz, 19 In., 6 PCI slots, standard
AGS-3328-3	PROCESSOR, Pentium IV 3.4 GHz, 19 In., 6 PCI slots, with redundant power supply
AGS-3389-2	PROCESSOR, Core 2 Duo 2.13 GHz, 19 In., 4 PCI slots, 3 PCIe slots, standard
AGS-3389-3	PROCESSOR, Core 2 Duo 2.13 GHz, 19 In., 4 PCI slots, 3 PCIe slots, with red. power supply
AGS-3390-1	PROCESSOR dual Xeon Dual-Core, 19 In., 6 PCI slots, with redundant power supply
AGS-3390-2	PROCESSOR single Xeon Dual-Core, 19 In., 6 PCI slots, with redundant power supply
AGS-3359-0	OMNIBUS A12, 19 In., with redundant power supply
AGS-3335-0	OMNIBUS A18, 19 In., standard, hot-swappable fans
AGS-3335-1	OMNIBUS A18, 19 In., redundant power supply, hot-swappable fans
EOS-3193-1	EXTENDER, 13 slots, 19 In., with redundant power supply
DRV-3349-0	hard drive in removable frame for **AGS-3328**; order options:
WinXP	**preinstalled operating system: Windows XP**
english	**language of user's manual: English**
DRV-3310-0	RAID 1 controller, including 2 hard drives for **AGS-3328**, **AGS-3389**, **AGS-3390** order options:
WinXP	**preinstalled operating system: Windows XP**
english	**language of user's manual: English**
DRV-3393-0	hard drive SATA in removable frame for **AGS-3389**, **AGS-3390** order options:
WinXP	**preinstalled operating system: Windows XP**
english	**language of user's manual: English**
DRV-3394-0	RAID 1 controller SATA, including 2 hard drives for **AGS-3389**, **AGS-3390** order options:
WinXP	**preinstalled operating system: Windows XP**
english	**language of user's manual: English**
DRV-3402-1	RAID 5 controller SATA, including 3 hard drives for **AGS-3389**, **AGS-3390** order options:
WinXP	**preinstalled operating system: Windows XP**
english	**language of user's manual: English**
DRV-3356-0	DVD-ROM drive for software upgrades
AGX-3281-1	UGX GRAPHIC CARD with DVI-D adapter cable, digital
	AGX-3281-0: UGX GRAPHIC CARD for TRANSFORM A, Dual-DVI connector, 4 channels **CBL-3242-0**: Dual-DVI to 2xDVI-D adapter cable
AGX-3281-2	UGX GRAPHIC CARD with CRT adapter cable, analog
	AGX-3281-0: UGX GRAPHIC CARD for TRANSFORM A, Dual-DVI connector, 4 channels **CBL-3243-0**: Dual-DVI to 2xCRT adapter cable
AGX-3313-1	OMNISCALER with Dual-DVI cable, digital
	AGX-3313-0: OMNISCALER, Dual-DVI connector, 2 channels **CBL-3264-0**: Dual-DVI to Dual-DVI cable
R9842979	QUAD SDI VIDEO CARD
R9842978	STREAMING VIDEO CARD SVC-1
R9832670	STREAMING VIDEO CARD SVC-2
	STREAMING VIDEO CARD J2K
R9842986	QUAD ANALOG VIDEO CARD
R9842987	DUAL RGB INPUT CARD
R9842985	DUAL DVI INPUT CARD

NET-3283-0	Ethernet card 10/100/1000 Mbps, PCI
NET-3283-3	Ethernet card 10/100/1000 Mbps, PCI, server
NET-3395-0	Ethernet card 10/100/1000 Mbps, PCIe x1
NET-3395-2	Ethernet card 10/100/1000 Mbps, PCIe x1, server
EOS-3052-1	Multiport-I/O card
TAS-3232-0	Logitech USB optical mouse with PS/2 adapter, 2.5m cable
TAS-3336-0	USB PC-Keyboard, English
TAS-3401-0	USB PC-keyboard/USB mouse extension with 20 m RJ-45 extension cable (**CBL-3380-5)**
TAS-3401-1	USB PC-keyboard/USB mouse extension with 50 m RJ-45 extension cable (**CBL-3380-6)**

Spare parts

MEM-3213-5	memory 256MB DDR RAM-DIMM for **AGS-3328**
MEM-3213-6	memory 512MB DDR RAM-DIMM for **AGS-3328**
MEM-3391-0	memory 512MB DDR2 RAM-DIMM for **AGS-3389**
MEM-3391-1	memory 1GB DDR2 RAM-DIMM for **AGS-3389**
R9842976	memory 1GB DDR2 FB DIMM for **AGS-3390-1/-2**
PSU-3284-0	spare power module 400W for PROCESSOR **AGS-3389-3/AGS-3328-3** or EXTENDER **EOS-3193-1**
	spare power module 650W for PROCESSOR **AGS-3390-1/-2**
PCX-3363-9	spare power module 600 W for OMNIBUS A12 **AG-S335-9**
PCX-3321-0	spare power module 600 W for OMNIBUS A18 **AGS-3335-1**
PCX-3342-0	spare fan module for OMNIBUS A18 **AGS-3335**
DRV-3349-9	spare hard disk drive P-ATA in removable frame without operating system for PROCESSOR **AGS-3328**
DRV-3310-9	spare hard disk drive P-ATA for RAID 1 in removable frame without operating system for PROCESSOR **AGS-3328** (or **AGS-3389/AGS-3390**)
DRV-3393-9	spare hard disk drive S-ATA in removable frame without operating system for PROCESSOR **AGS-3389/AGS-3390**
DRV-3394-9	spare hard disk drive S-ATA for RAID 1 in removable frame without operating system for PROCESSOR **AGS-3389/AGS-3390**
DRV-3402-9	spare hard disk drive S-ATA for RAID 5 in removable frame without operating system for PROCESSOR **AGS-3389/AGS-3390**
EOS-3104-0	dust filter for PROCESSOR
EOS-3104-1	dust filter for OMNIBUS A12 and EXTENDER
PCX-3225-0	dust filter for OMNIBUS A18

Cables and adapters

	graphics data:
CBL-3206-0	DVI-D <–> DVI-D, max. UXGA, 2 m
CBL-3206-2	DVI-D <–> DVI-D, max. UXGA, 5 m
CBL-3206-3	DVI-D <–> DVI-D, max. SXGA+, 10 m
CBL-3206-4	DVI-D <–> DVI-D, max. SXGA+, 20 m
R9842989	DVI-D –> DVI-D optical, max. UXGA, 10 m
R9842990	DVI-D –> DVI-D optical, max. UXGA, 20 m
R9842991	DVI-D –> DVI-D optical, max. UXGA, 50 m
R9842992	DVI-D –> DVI-D optical, max. UXGA, 100 m
CBL-3242-0	Dual-DVI –> 2xDVI-D adapter cable
CBL-3243-0	Dual-DVI –> 2xCRT adapter cable
CBL-3264-0	Dual-DVI <–> Dual-DVI cable, 0.5 m
CBL-3264-1	Dual-DVI <–> Dual-DVI cable, 1.5 m
CBL-3205-0	DVI-D –> MDR26 adapter, 0.2 m
R9842821	3×RCA –> DVI-A analog video cable, 3 m, for DUAL DVI INPUT CARD
R9842822	3×RCA –> DVI-A analog video cable, 7.5 m, for DUAL DVI INPUT CARD
R9842823	3×RCA –> DVI-A analog video cable, 15 m, for DUAL DVI INPUT CARD
R9842824	3×RCA –> DVI-A analog video cable, 30 m, for DUAL DVI INPUT CARD
CBL-3190	HD15 –> DVI-A adapter, for DUAL DVI INPUT CARD

R9842825	5×BNC –> DVI-A adapter cable, 0.75 m, for DUAL DVI INPUT CARD
R9842826	HDMI –> DVI-D adapter, for DUAL DVI INPUT CARD
CBL-3380-2	Remote power on/off cable
Software	
CRS-3045-C	CD-ROM TRANSFORM A Suite including graphic driver for TRANSFORM A
EOS-3070-5	TRANSFORM A base license Processor configuration
LIC-3291-0	TRANSFORM A base license OmniBus configuration
LIC-3291-2	Driver license per graphic channel of UGX GRAPHIC CARD
LIC-3348-0	Windows XP Professional license, multilingual

Table 7-17

8 Trouble shooting

8.1 TransForm A not booting

When TRANSFORM A is not booting properly it is important to state at which point of the boot process a fault occurs. The display while booting is as follows, so you can see where the process is stopped.

On the first display (**board 1**/**port 0**, see section 3.2.5 Graphic cards):

```
M3 PCI 128b

DDCinfo: Native DFC resolution is 1024x768@68Hz

ARGUS AGX-3000
VGA BIOS-3000-04    06.08.02    COPYRIGHT © 2002 BARCO Control Rooms

PCX-3000[0] -> MIPS RAM Base: $F000000 -> Number of VGAs: 0
PCX-3000[1] -> MIPS RAM Base: $E600000 -> Number of VGAs: 6 (PGA inside)

Total amount of VGAs: 6

Scan system for AGX-3000

Dev BP Bus Slot
=== == === ====
  0  1   3   0  init...  BAs: $1C000008/$0000B401/$48640000  done  PGA
  1  1   3   1  init...  BAs: $20000008/$0000B401/$48644000  done
  2  1   8   0  init...  BAs: $2C000008/$0000B401/$48720000  done
  3  1   8   1  init...  BAs: $30000008/$0000B401/$48724000  done
  4  1  11   0  init...  BAs: $38000008/$0000B401/$48C40000  done
  5  1  11   1  init...  BAs: $3C000008/$0000B401/$48C44000  done
```

The other displays show their respective bus and slot no., e. g.:

```
M3 PCI 128b

ARGUS AGX-3000
VGA BIOS-3000-04    06.08.02    COPYRIGHT © 2002 BARCO Control Rooms
Dev:  1,  BP:  1,  PCI Bus: 3, Slot: 1  BAs: $20000008/$0000B401/$48644000
DDCinfo: Native DFP resolution is 1024x768@68Hz
```

fault	cause/steps

boot process is aborted while
`Dev BP Bus Slot`
`=== == === ====`
`0 1 3 0 init... BAs: $1C000008`
`/$0000B401/$48640000 done PGA`
`1 1 3 1 init... BAs: $20000008`
`/$0000B401/$48644000 done`
etc. is displayed.
	There is probably a problem with the graphic cards. Ask an authorized person to make sure that all graphic cards are inserted correctly.
	If the fault remains, contact Barco, please.

boot process is aborted, `CMOS checksum error` appears on the display	The battery is empty. Ask an authorized person to replace it by a fresh one.
boot process is aborted, `This PC has no hard disk or hard disk is unreadable. SYSTEM HALTED` appears on the display	Check the removable frame of the hard disk drive, if it is inserted properly and locked. If the error message remains after restarting TRANSFORM A, contact Barco, please.

8.2 Other faults

fault	cause/steps
The video window remains empty after starting a video.	If displaying video without OMNISCALER (analog output) a suitable color depth must be set for the desktop, therefore open the **Display Properties** dialog box as described in section 3.5.2 Configuring the display driver. Click the **Settings** tab. In the **Color Palette** box select one of the settings listed in the table below.

8.3 Contact

Hot line

Feel free to contact us if you have any further questions!

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